

$V_{DSS}$	600V
$R_{DS(on)}(Max.)$	0.27 $\Omega$
$I_D$	$\pm 18A$
$P_D$	100W

●特長

- 1) 低オン抵抗
- 2) 高速スイッチングスピード
- 3) ゲート・ソース間電圧 $V_{GSS}=\pm 30V$  保証
- 4) 駆動回路が簡単
- 5) 並列使用が容易
- 6) 鉛フリー対応済み、RoHS準拠

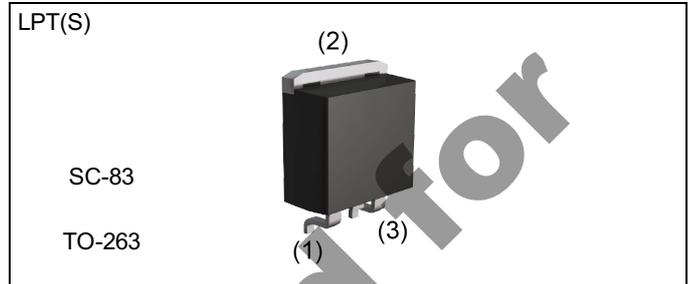
●用途

スイッチング

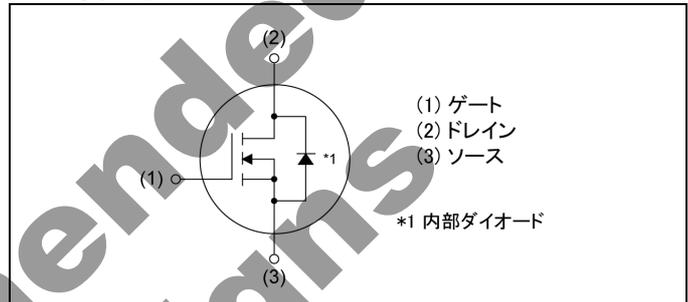
●絶対最大定格( $T_a=25^\circ C$ )

Parameter	Symbol	Value	Unit	
ドレイン・ソース間電圧	$V_{DSS}$	600	V	
ドレイン電流 (直流)	$T_C = 25^\circ C$	$I_D^{*1}$	$\pm 18$	A
	$T_C = 100^\circ C$	$I_D^{*1}$	$\pm 8.7$	A
ドレイン電流 (パルス)	$I_{D,pulse}^{*2}$	$\pm 72$	A	
ゲート・ソース間電圧	$V_{GSS}$	$\pm 30$	V	
アバランシェエネルギー (単発)	$E_{AS}^{*3}$	21.6	mJ	
アバランシェエネルギー (連続)	$E_{AR}^{*4}$	8.4	mJ	
アバランシェ電流	$I_{AR}^{*3}$	9	A	
許容損失 ( $T_C = 25^\circ C$ )	$P_D$	100	W	
ジャンクション温度	$T_j$	150	$^\circ C$	
保存温度	$T_{stg}$	-55~+150	$^\circ C$	
ターンオフ電圧変化率 (ダイオード)	dv/dt	15	V/ns	

●外形図



●内部回路図



●包装仕様

タイプ	包装形態	Embossed Tape
	リールサイズ (mm)	330
	テープ幅 (mm)	24
	基本発注単位 (個)	1000
	テーピングコード	TL
	標印	R6018ANJ

## ●絶対最大定格

Parameter	Symbol	Conditions	Values	Unit
ターンオフ電圧変化率 (MOSFET)	dv/dt	$V_{DS} = 480V, I_D = 18A$ $T_j = 125^\circ C$	50	V/ns

## ●熱抵抗

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
熱抵抗 (ジャンクション・ケース間)	$R_{thJC}$	-	-	1.25	$^\circ C/W$
熱抵抗 (ジャンクション・外気間)	$R_{thJA}$	-	-	80	$^\circ C/W$
実装温度 (ウエーブソルダリング 10秒)	$T_{sold}$	-	-	265	$^\circ C$

●電気的特性 ( $T_a = 25^\circ C$ )

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
ドレイン・ソース降伏電圧	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 1mA$	600	-	-	V
ドレイン・ソースアバランシェ降伏電圧	$V_{(BR)DS}$	$V_{GS} = 0V, I_D = 18A$	-	700	-	V
ドレイン遮断電流	$I_{DSS}$	$V_{DS} = 600V, V_{GS} = 0V$ $T_j = 25^\circ C$	-	0.1	100	$\mu A$
		$T_j = 125^\circ C$	-	-	1000	
ゲート漏れ電流	$I_{GSS}$	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	$\pm 100$	nA
ゲートしきい値電圧	$V_{GS(th)}$	$V_{DS} = 10V, I_D = 1mA$	2.5	-	4.5	V
ドレイン・ソース間オン抵抗	$R_{DS(on)}^{*6}$	$V_{GS} = 10V, I_D = 9A$ $T_j = 25^\circ C$	-	0.21	0.27	$\Omega$
		$T_j = 125^\circ C$	-	0.42	-	
ゲート抵抗	$R_G$	$f = 1MHz, open\ drain$	-	8.4	-	$\Omega$

●電気的特性 ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
伝達コンダクタンス	$g_{fs}^{*6}$	$V_{DS} = 10\text{V}, I_D = 9\text{A}$	6.5	13	-	S
入力容量	$C_{iss}$	$V_{GS} = 0\text{V}$	-	2050	-	pF
出力容量	$C_{oss}$	$V_{DS} = 25\text{V}$	-	1400	-	
帰還容量	$C_{riss}$	$f = 1\text{MHz}$	-	60	-	
有効出力容量 (エネルギー)	$C_{o(er)}$	$V_{GS} = 0\text{V},$ $V_{DS} = 0\text{V} \sim 480\text{V}$	-	80	-	pF
有効出力容量 (時間)	$C_{o(tr)}$		-	85	-	
ターンオン遅延時間	$t_{d(on)}^{*6}$	$V_{DD} \approx 300\text{V}, V_{GS} = 10\text{V}$	-	37	-	ns
上昇時間	$t_r^{*6}$	$I_D = 9\text{A}$	-	85	-	
ターンオフ遅延時間	$t_{d(off)}^{*6}$	$R_L \approx 33.3\Omega$	-	155	310	
下降時間	$t_f^{*6}$	$R_G = 10\Omega$	-	65	130	

●ゲート電荷量特性 ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
ゲート総電荷量	$Q_g^{*6}$	$V_{DD} \approx 300\text{V}$	-	55	-	nC
ゲート・ソース間電荷量	$Q_{gs}^{*6}$	$I_D = 18\text{A}$	-	10	-	
ゲート・ドレイン間電荷量	$Q_{gd}^{*6}$	$V_{GS} = 10\text{V}$	-	22	-	
ゲートプラトー電圧	$V_{(plateau)}$	$V_{DD} \approx 300\text{V}, I_D = 18\text{A}$	-	6	-	V

\*1 安全動作領域内でご使用ください。

\*2  $P_w \leq 10 \mu\text{s}$ , Duty cycle  $\leq 1\%$

\*3  $L \approx 500 \mu\text{H}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25 \Omega$ , 開始温度  $T_j = 25^\circ\text{C}$

\*4  $L \approx 500 \mu\text{H}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25 \Omega$ , 開始温度  $T_j = 25^\circ\text{C}$ ,  $f = 10\text{kHz}$

\*5 測定回路図 Fig. 5-1 参照。

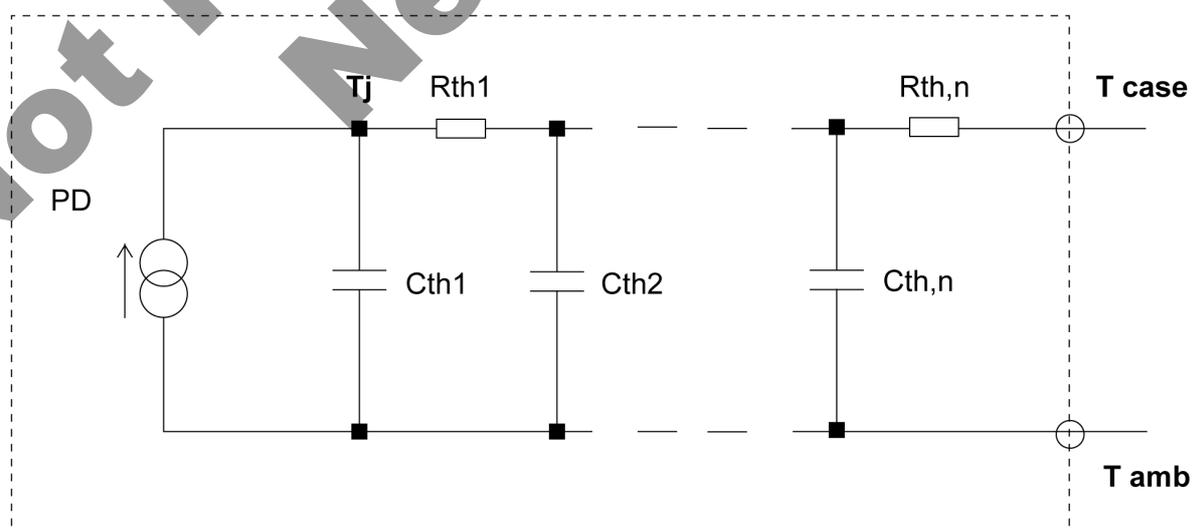
\*6 パルス負荷

●内部ダイオード特性 (ソース・ドレイン間) ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
順方向電流	$I_S^{*1}$	$T_C = 25^\circ\text{C}$	-	-	18	A
尖頭順サージ電流	$I_{SM}^{*2}$		-	-	72	A
順方向電圧	$V_{SD}^{*6}$	$V_{GS} = 0\text{V}, I_S = 18\text{A}$	-	-	1.5	V
逆回復時間	$t_{rr}^{*6}$	$I_S = 18\text{A}$ $di/dt = 100\text{A}/\mu\text{s}$	-	461	-	ns
逆回復電荷量	$Q_{rr}^{*6}$		-	6.8	-	$\mu\text{C}$
逆回復ピーク電流	$I_{rm}^{*6}$		-	28	-	A
逆回復電流の降下率	$di_{rr}/dt$	$T_j = 25^\circ\text{C}$	-	730	-	$\text{A}/\mu\text{s}$

## ●過渡熱特性

Symbol	Value	Unit	Symbol	Value	Unit
$R_{th1}$	0.0508	K/W	$C_{th1}$	0.00281	Ws/K
$R_{th2}$	0.189		$C_{th2}$	0.0106	
$R_{th3}$	0.601		$C_{th3}$	0.221	



●電気的特性曲線

Fig.1 Power Dissipation Derating Curve

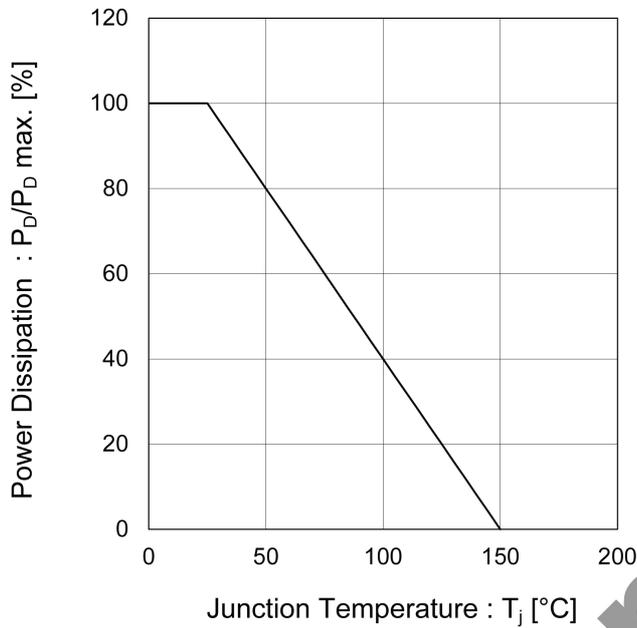


Fig.2 Maximum Safe Operating Area

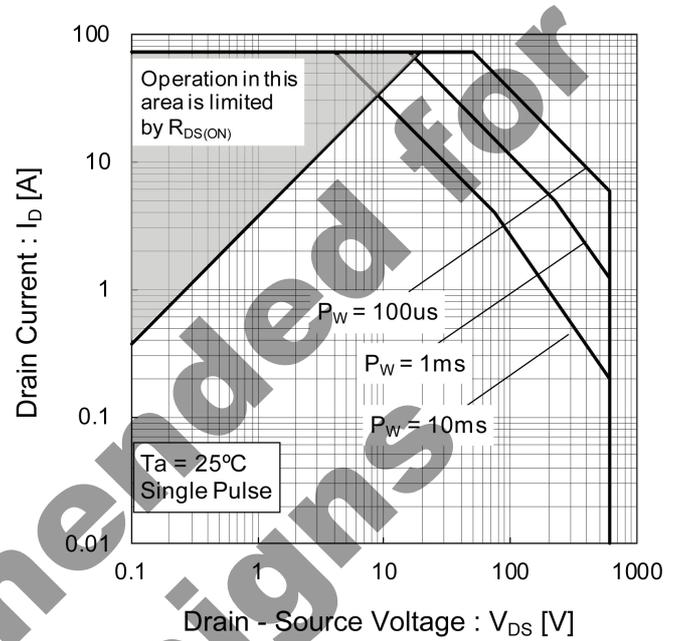
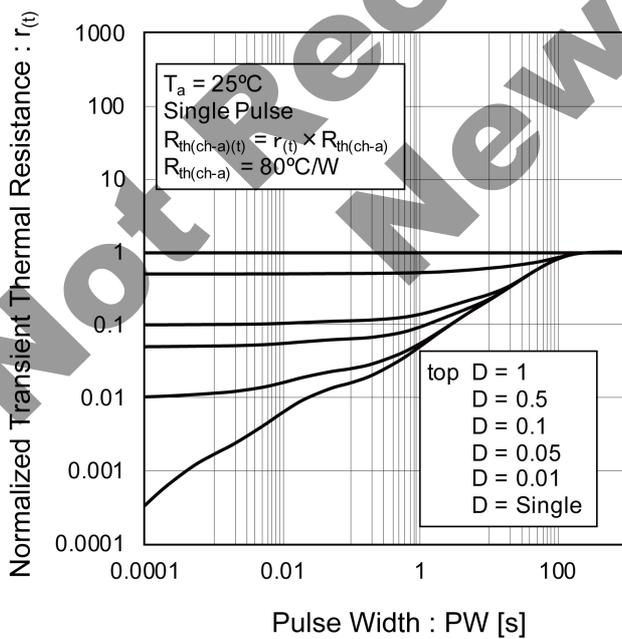


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width



●電氣的特性曲線

Fig.4 Avalanche Current vs. Inductive Load

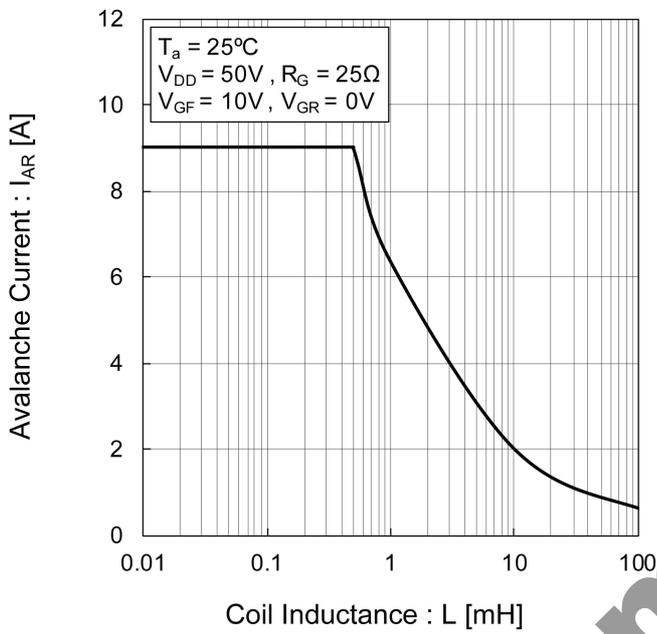


Fig.5 Avalanche Power Losses

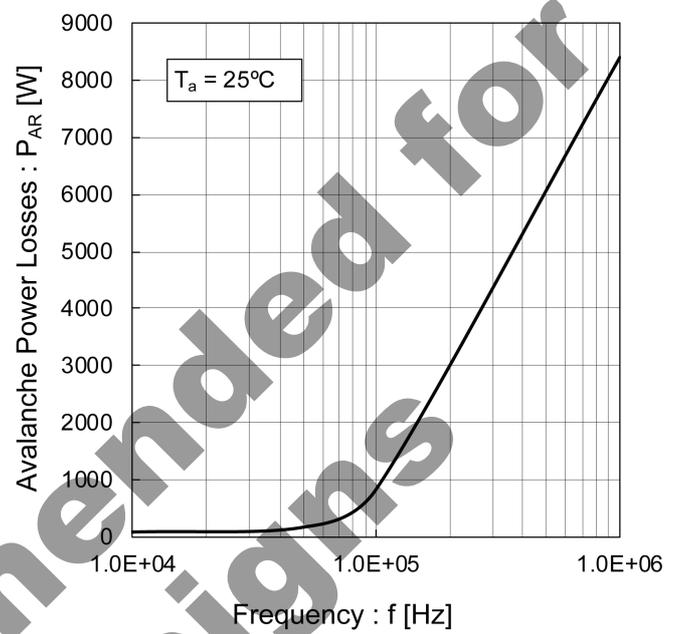
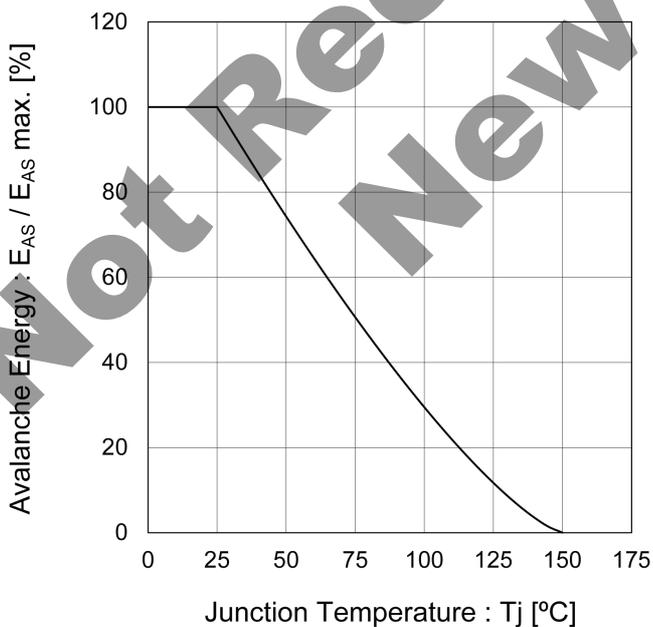


Fig.6 Avalanche Energy Derating Curve vs. Junction Temperature



●電氣的特性曲線

Fig.7 Typical Output Characteristics(I)

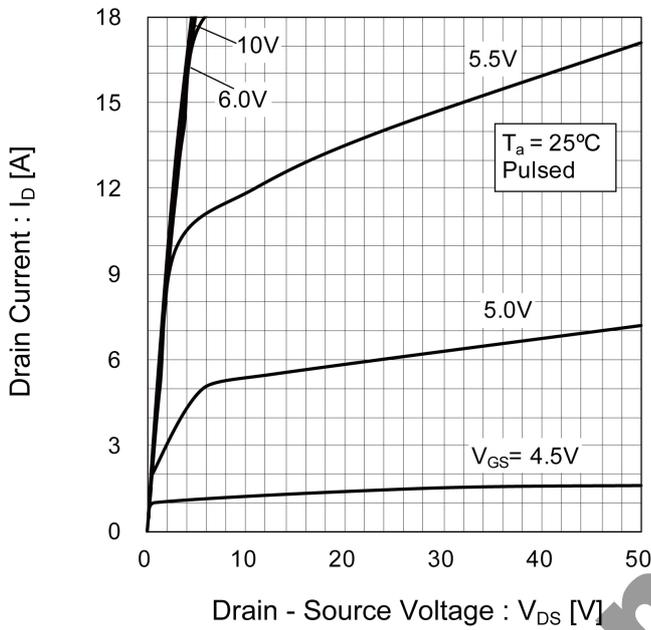


Fig.8 Typical Output Characteristics(II)

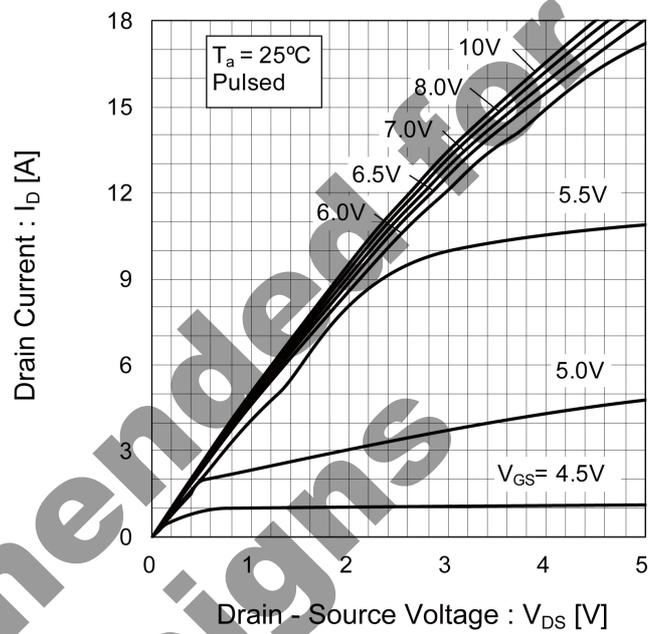


Fig.9  $T_j = 150^\circ\text{C}$  Typical Output Characteristics (I)

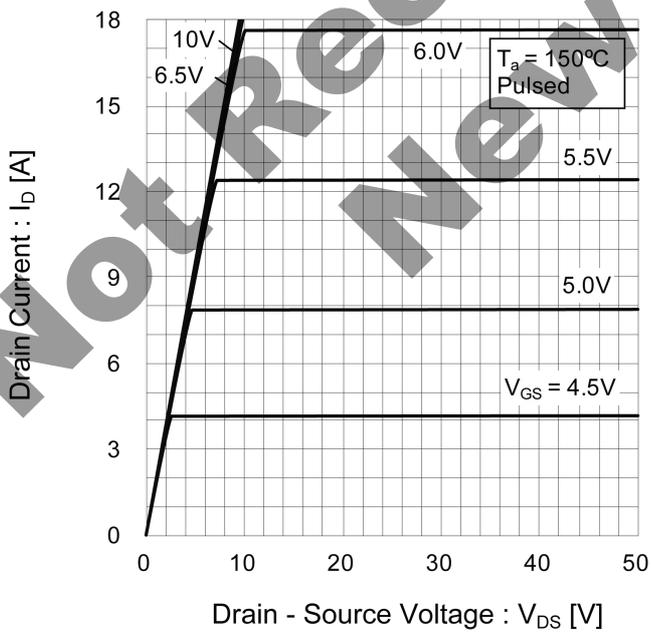
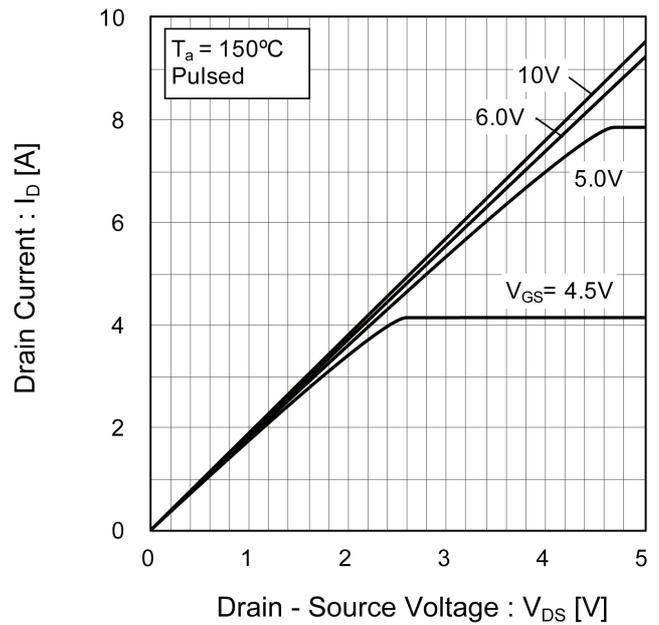


Fig.10  $T_j = 150^\circ\text{C}$  Typical Output Characteristics (II)



●電気的特性曲線

Fig.11 Breakdown Voltage vs. Junction Temperature

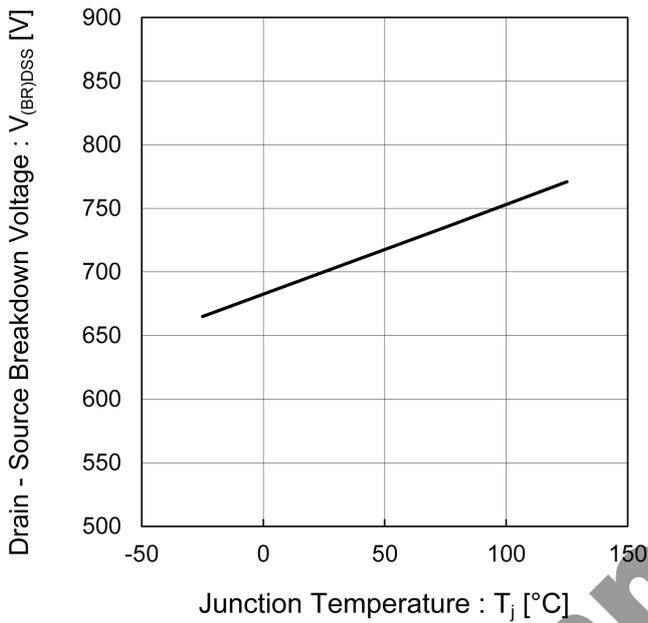


Fig.12 Typical Transfer Characteristics

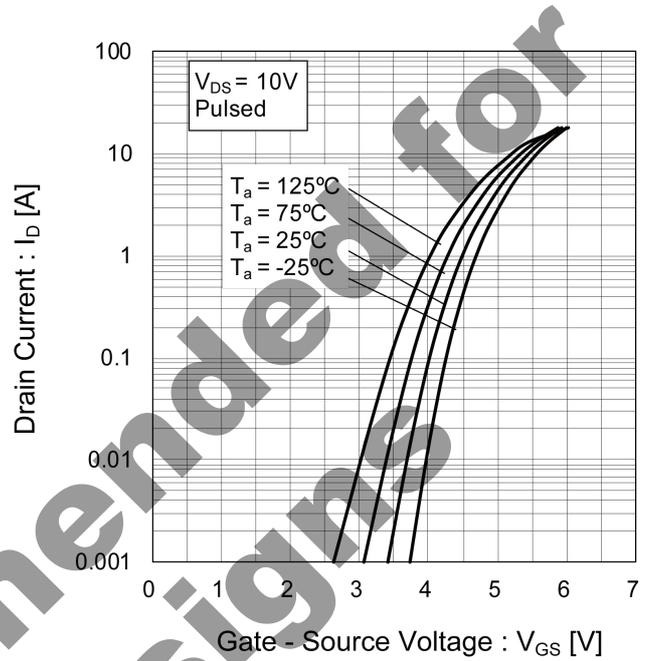


Fig.13 Gate Threshold Voltage vs. Junction Temperature

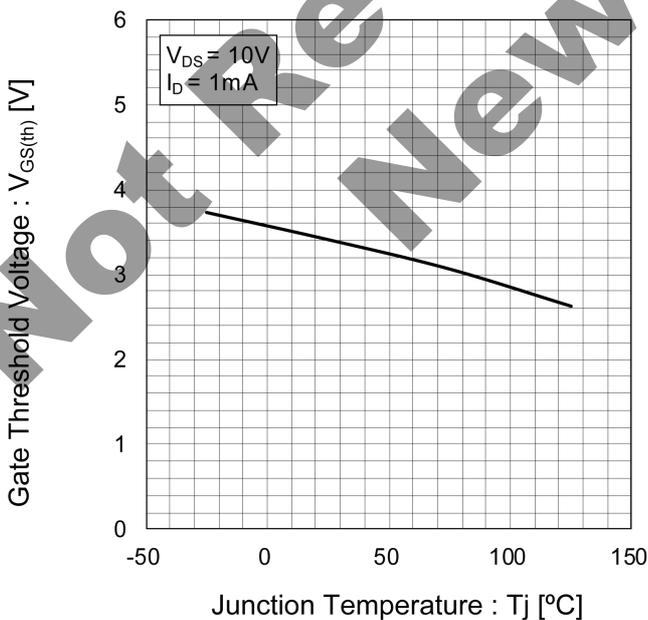
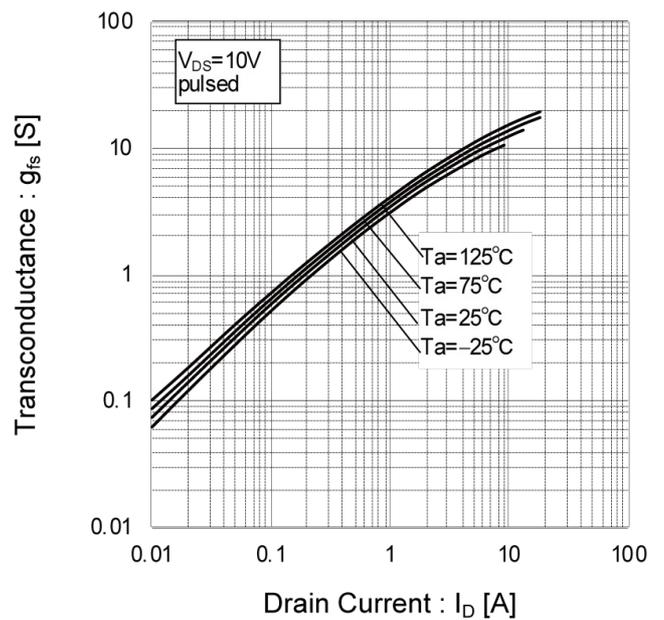


Fig.14 Transconductance vs. Drain Current



●電気的特性曲線

Fig.15 Static Drain - Source On - State Resistance vs. Gate Source Voltage

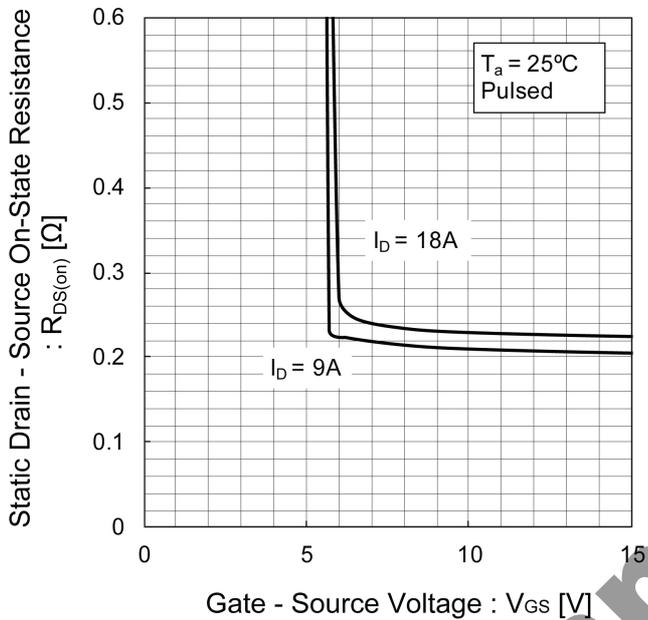


Fig.16 Static Drain - Source On - State Resistance vs. Junction Temperature

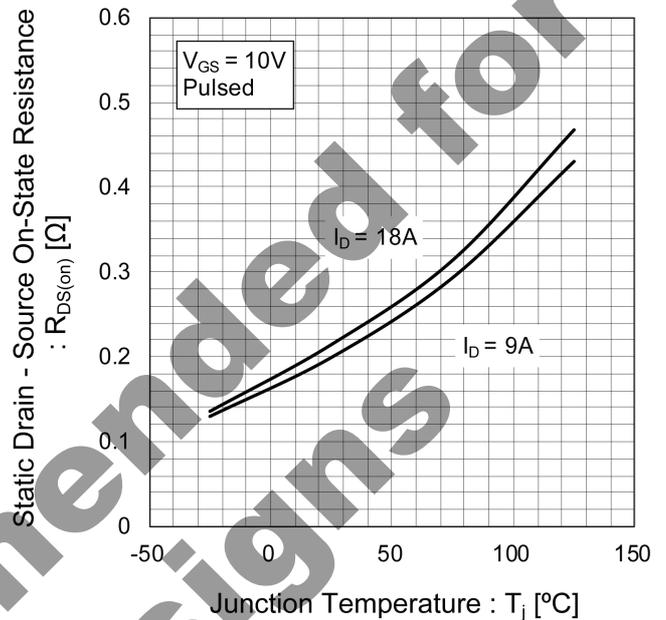
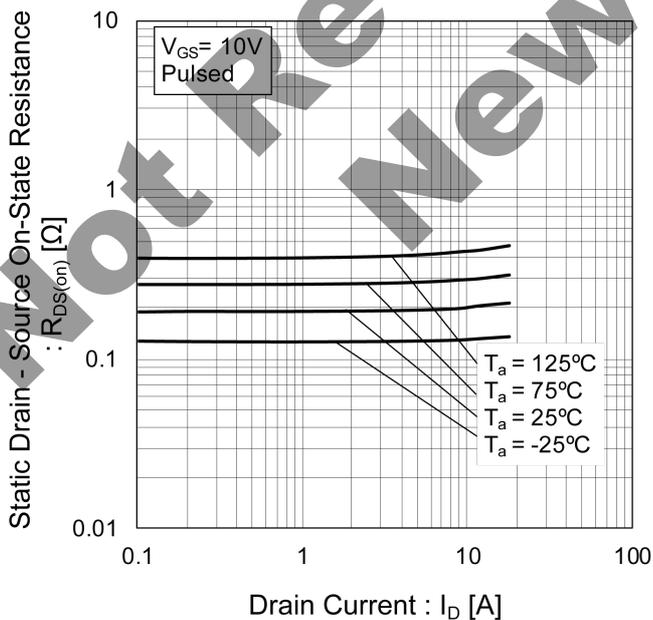


Fig.17 Static Drain - Source On - State Resistance vs. Drain Current



●電気的特性曲線

Fig.18 Typical Capacitance vs. Drain - Source Voltage

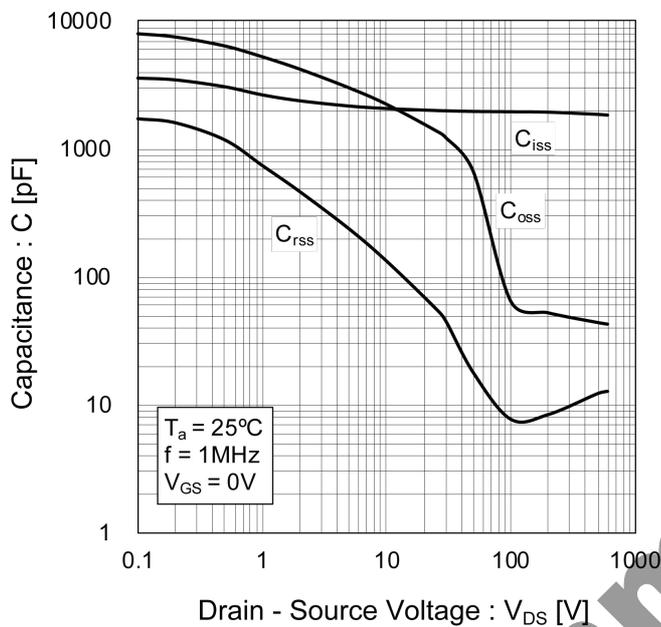


Fig.19 Coss Stored Energy

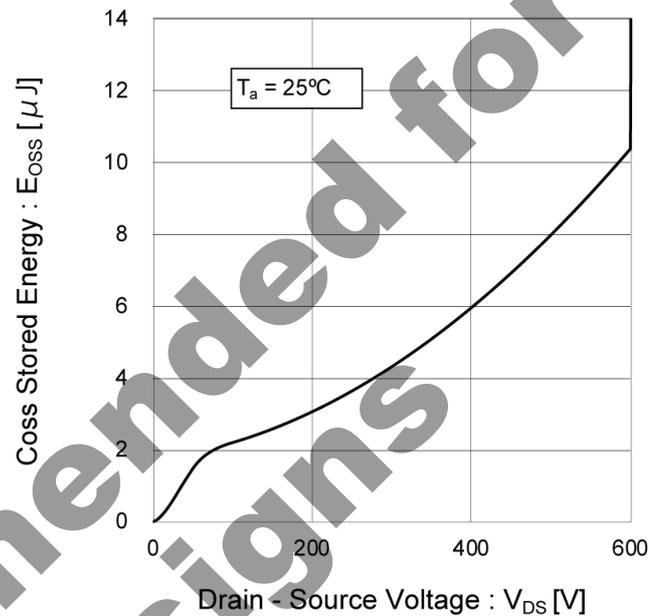


Fig.20 Switching Characteristics

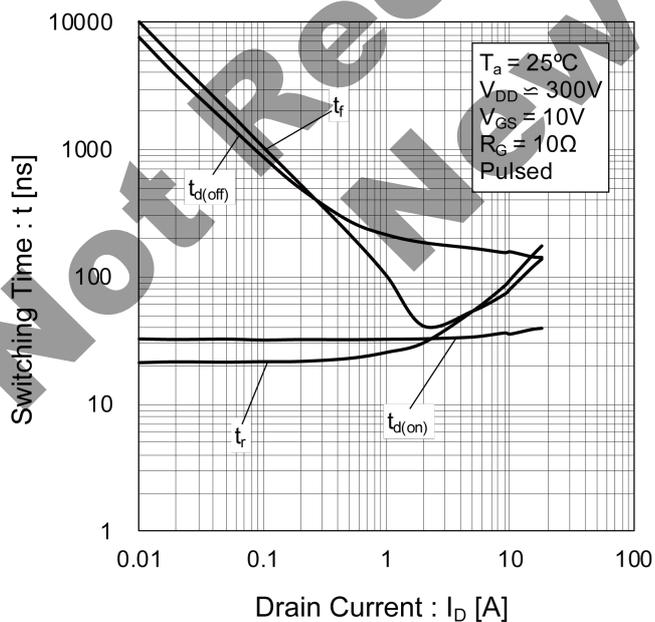
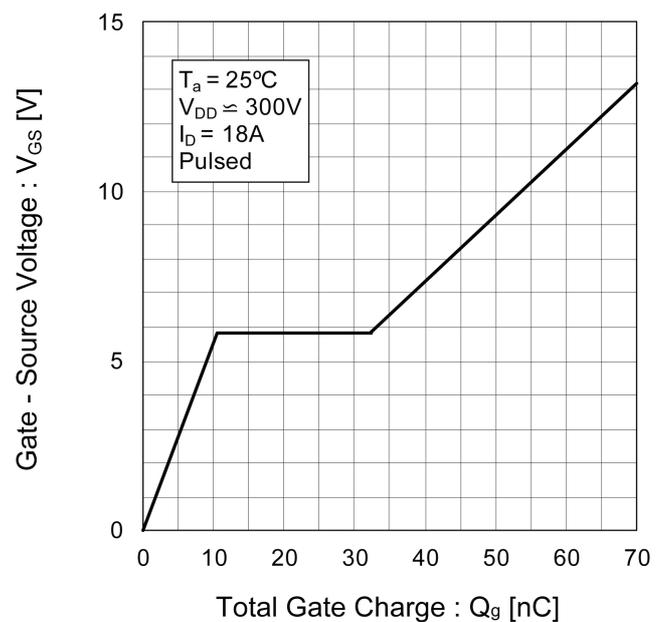


Fig.21 Dynamic Input Characteristics



●電気的特性曲線

Fig.22 Inverse Diode Forward Current vs. Source - Drain Voltage

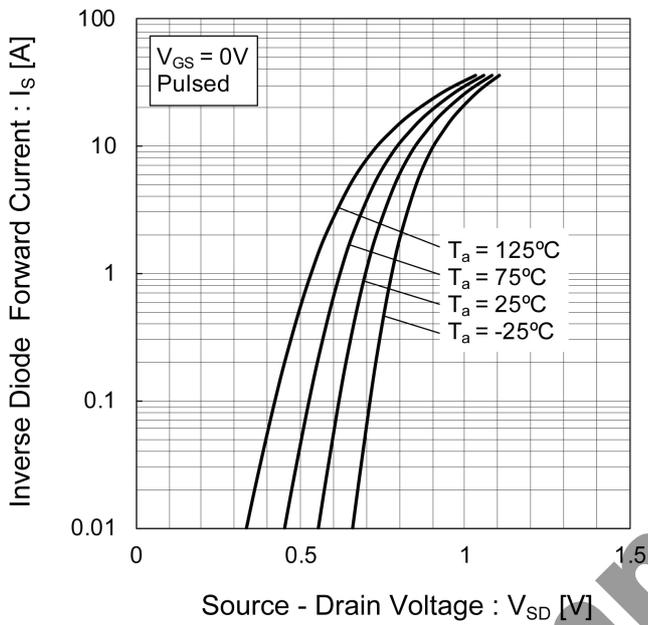
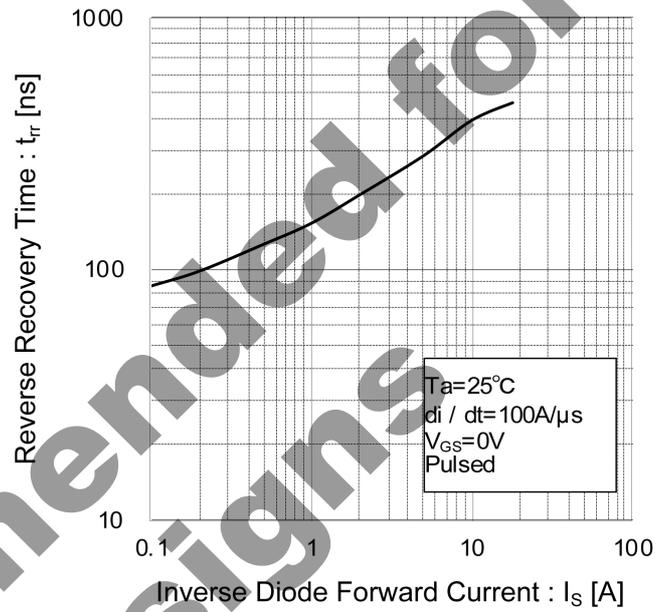


Fig.23 Reverse Recovery Time vs. Inverse Diode Forward Current



Not Recommended for New Designs

●測定回路図

Fig.1-1 スイッチング時間測定回路

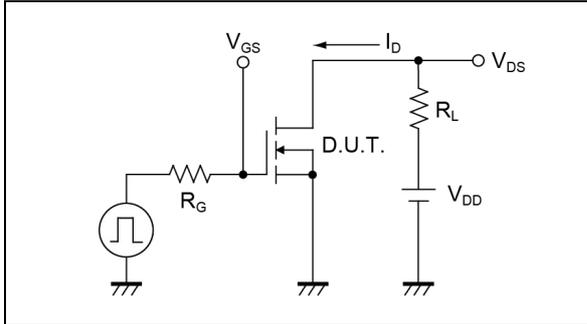


Fig.1-2 スイッチング波形

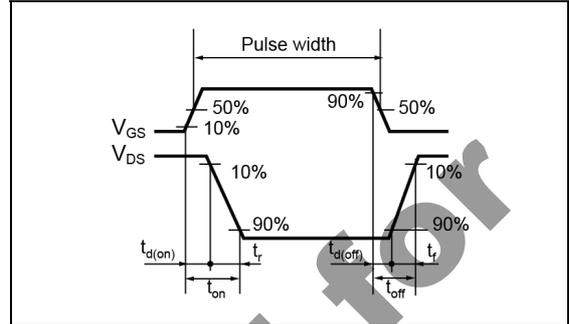


Fig.2-1 ゲート電荷量測定回路

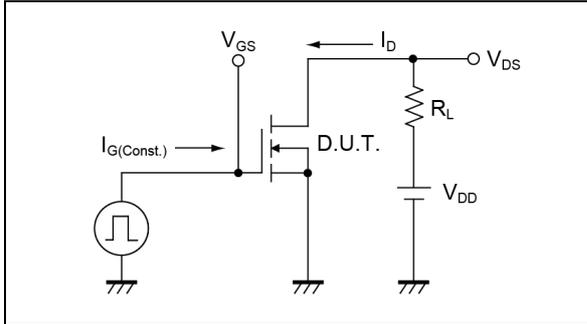


Fig.2-2 ゲート電荷量波形

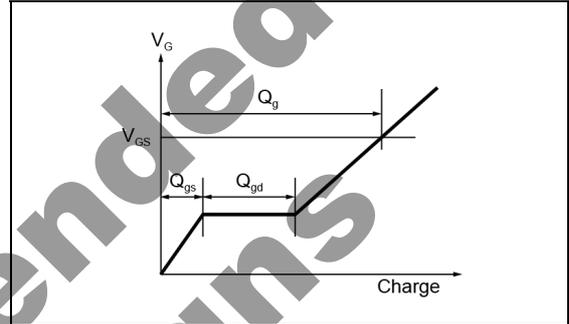


Fig.3-1 アバランシェ測定回路

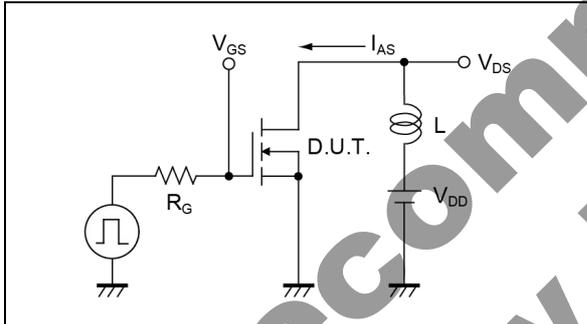


Fig.3-2 アバランシェ波形

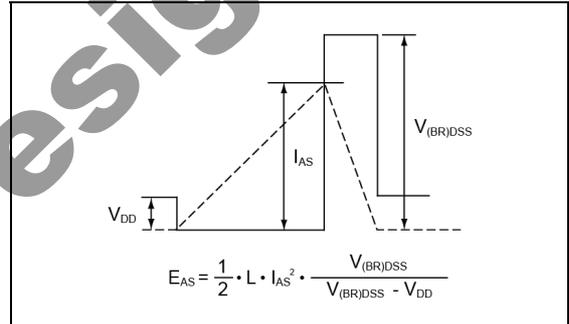


Fig.4-1 dv/dt 測定回路

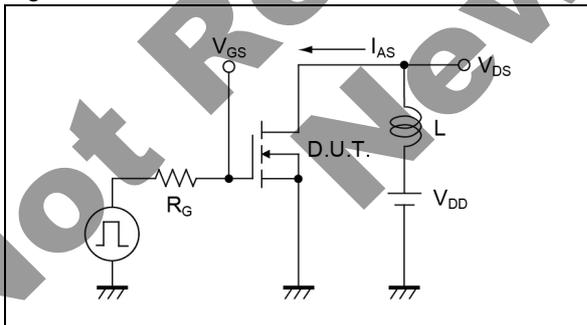


Fig.4-2 dv/dt 波形

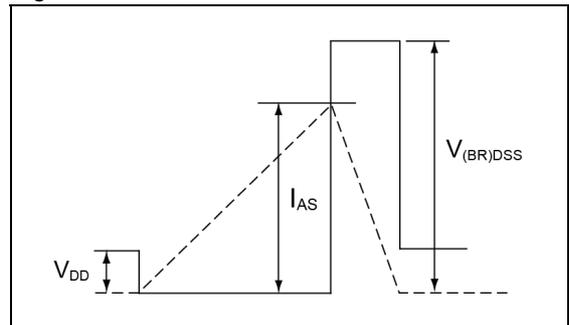


Fig.5-1 di/dt 測定回路

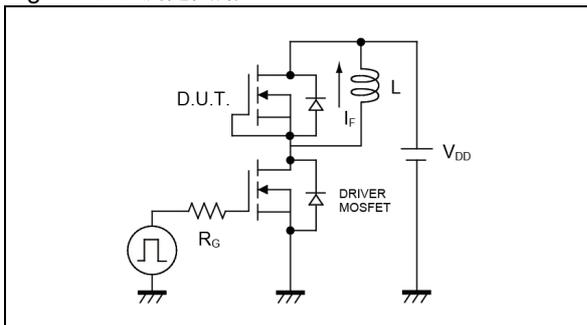
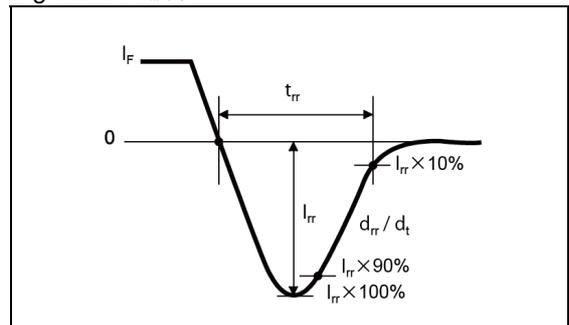
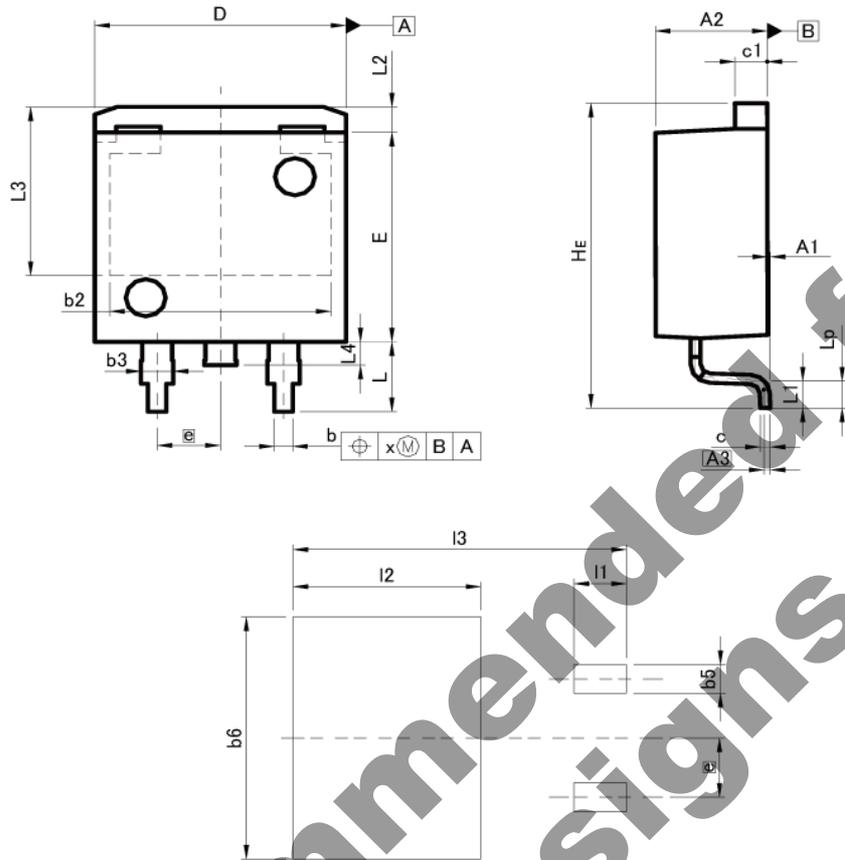


Fig.5-2 di/dt 波形



●外形寸法図

LPTS  
< TO-263 >  
( D2PAK )



Pattern of terminal position areas  
[Not a pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A1	0.00	0.30	0.000	0.012
A2	4.30	4.70	0.169	0.185
A3	0.25		0.010	
b	0.68	0.98	0.027	0.039
b2	8.90		0.350	
b3	1.14	1.44	0.045	0.057
c	0.30	0.60	0.012	0.024
c1	1.10	1.50	0.043	0.059
D	9.80	10.40	0.386	0.409
E	8.80	9.20	0.346	0.362
e	2.54		0.100	
HE	12.80	13.40	0.504	0.528
L	2.70	3.30	0.106	0.130
L1	0.90	1.50	0.035	0.059
L2	1.10		0.043	
L3	7.25		0.285	
L4	1.00		0.039	
Lp	0.90	1.50	0.035	0.059
x	-	0.25	-	0.010

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b5	-	1.23	-	0.049
b6	-	10.40	-	0.409
I1	-	2.10	-	0.083
I2	-	7.55	-	0.297
I3	-	13.40	-	0.528

Dimension in mm/inches

**Not Recommended for  
New Designs**