SCT2080KE

N-channel SiC power MOSFET

Datasheet

V_{DSS}	1200V
$R_{DS(on)}$ (Typ.)	80mΩ
I_D	35A
P_D	179W

●外観図

TO-247

(1) (2) (3)

●特長

1) 低オン抵抗

2) 高速スイッチングスピード

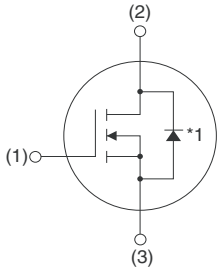
3) 高速リカバリー

4) 並列使用が容易

5) 駆動回路が簡単

6) Pbフリー対応済み、 RoHS準拠

●内部回路図



(1) ゲート
(2) ドレイン
(3) ソース

*1 内部ダイオード

●用途

・太陽光発電

・DC/DC コンバーター

・誘導加熱

・モータードライブ

●包装仕様

タイプ	包装形態	チューブ
	リールサイズ (mm)	-
	テープ幅 (mm)	-
	基本発注単位(個)	30
	テーピングコード	-
	標印	SCT2080KE

●絶対最大定格 (T_a = 25°C)

Parameter		Symbol	Value	Unit
ドレイン・ソース間電圧		V_{DSS}	1200	V
ドレイン電流（直流）	T_c = 25°C	I_D *1	35	A
	T_c = 100°C	I_D *1	22	A
ドレイン電流（パルス）		$I_{D,pulse}$ *2	80	A
ゲート・ソース間電圧		V_{GSS}	−6 ～ 22	V
許容損失 (T_c = 25°C)		P_D	179	W
ジャンクション温度		T_j	150	°C
保存温度		T_{stg}	−55 ～ +150	°C

●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}	-	-	0.7	°C/W
熱抵抗（ジャンクション・外気間）	R_{thJA}	-	-	50	°C/W
実装温度（ウエーブソルダリング 10秒）	T_{sold}	-	-	265	°C

●電気的特性 (T_a = 25°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	1200	-	-	V
ドレイン遮断電流	I_{DSS}	V_{DS} = 1200V, V_{GS} = 0V				μA
		T_j = 25°C	-	1	10	
		T_j = 150°C	-	2	-	
ゲート漏れ電流	I_{GSS+}	V_{GS} = +22V, V_{DS} = 0V	-	-	100	nA
ゲート漏れ電流	I_{GSS-}	V_{GS} = −6V, V_{DS} = 0V	-	-	−100	nA
ゲートしきい値電圧	$V_{GS\ (th)}$	V_{DS} = V_{GS}, I_D = 4.4mA	1.6	-	4.0	V
ドレイン・ソース間オン抵抗	$R_{DS(on)}$ *3	V_{GS} = 18V, I_D = 10A				mΩ
		T_j = 25°C	-	80	117	
		T_j = 125°C	-	125	-	
ゲート抵抗	R_G	f = 1MHz, open drain	-	6.3	-	Ω

●**電気的特性** (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
伝達コンダクタンス	g_{fs} *3	V_{DS} = 10V, I_D = 10A	-	3.7	-	S
入力容量	C_{iss}	V_{GS} = 0V	-	2080	-	pF
出力容量	C_{oss}	V_{DS} = 800V	-	77	-	
帰還容量	C_{rss}	f = 1MHz	-	16	-	
有効出力容量（エネルギー）	$C_{o(er)}$	V_{GS} = 0V V_{DS} = 0V ～ 500V	-	116	-	pF
ターンオン遅延時間	$t_{d(on)}$ *3	V_{DD} = 400V, V_{GS} = 18V	-	35	-	ns
上昇時間	t_r *3	I_D = 10A	-	36	-	
ターンオフ遅延時間	$t_{d(off)}$ *3	R_L = 40Ω	-	76	-	
下降時間	t_f *3	R_G = 0Ω	-	22	-	

●**ゲート電荷量特性** (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
ゲート総電荷量	Q_g *3	V_{DD} = 400V	-	106	-	nC
ゲート・ソース間電荷量	Q_{gs} *3	I_D = 10A	-	27	-	
ゲート・ドレイン間電荷量	Q_{gd} *3	V_{GS} = 18V	-	31	-	
ゲートプラトー電圧	$V_{(plateau)}$	V_{DD} = 400V, I_D = 10A	-	9.7	-	V

*1 安全動作領域内でご使用ください。

*2 PW ≤ 10μs, Duty cycle ≤ 1%

*3 パルス負荷

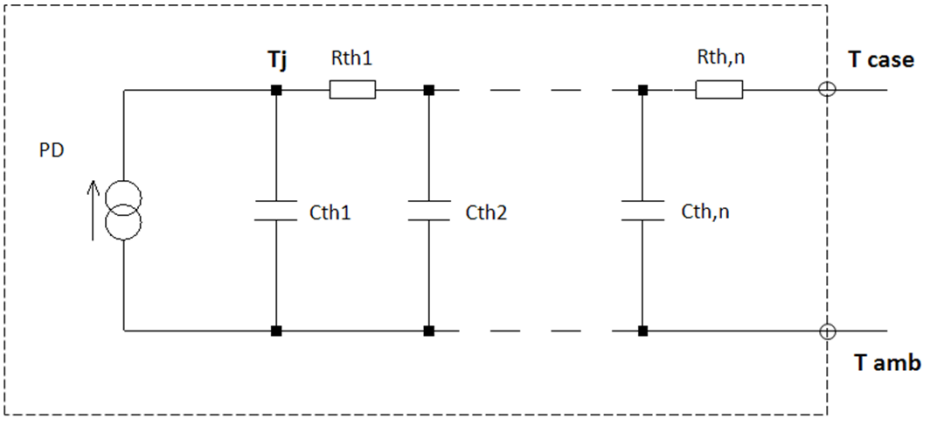
●内部ダイオード特性 (ソース・ドレイン間) (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
順方向電流	I_S *1	T_c = 25°C	-	-	25	A
尖頭順サージ電流	I_{SM} *2		-	-	80	A
順方向電圧	V_{SD} *3	V_{GS} = 0V, I_S = 10A	-	4.6	-	V
逆回復時間	t_{rr} *3	I_F = 10A, V_R = 400V di/dt = 150A/μs	-	31	-	ns
逆回復電荷量	Q_{rr} *3		-	44	-	nC
逆回復ピーク電流	I_{rrm} *3		-	2.3	-	A

●過渡熱特性

Symbol	Value	Unit
R_{th1}	0.098	K/W
R_{th2}	0.237	
R_{th3}	0.212	

Symbol	Value	Unit
C_{th1}	0.005	Ws/K
C_{th2}	0.032	
C_{th3}	0.666	



●電気的特性曲線

Fig.1 Power Dissipation Derating Curve

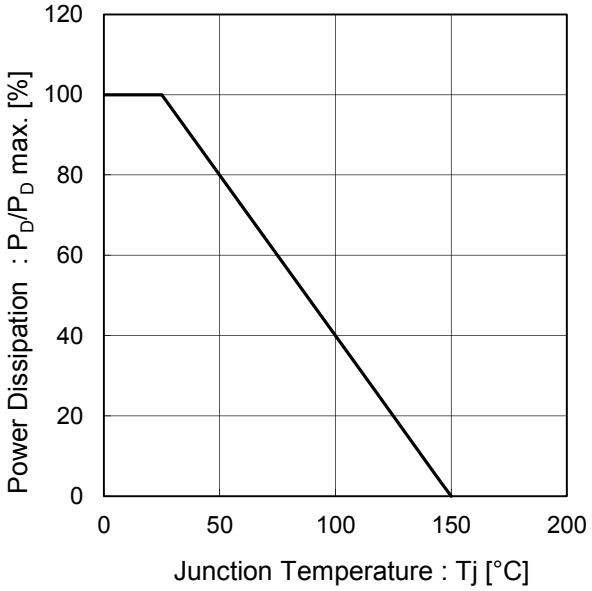


Fig.2 Maximum Safe Operating Area

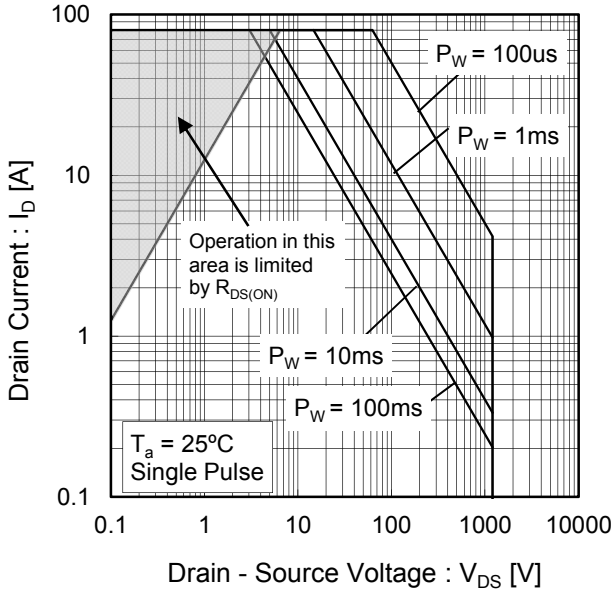
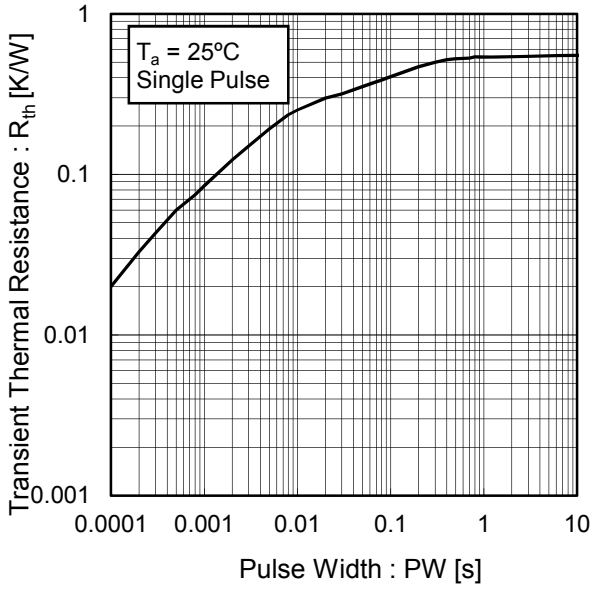


Fig.3 Typical Transient Thermal Resistance vs. Pulse Width



●電気的特性曲線

Fig.4 Typical Output Characteristics(I)

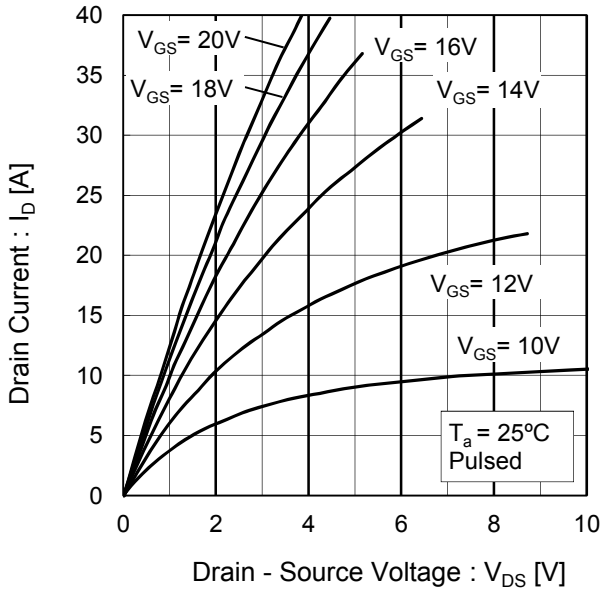


Fig.5 Typical Output Characteristics(II)

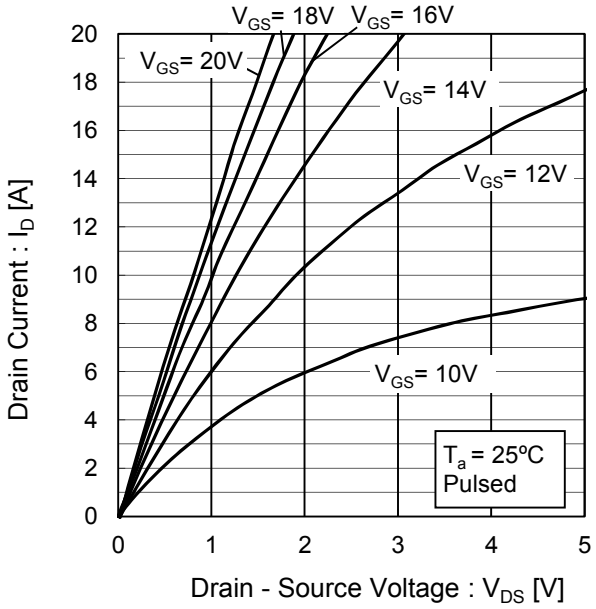


Fig.6 T_j = 150°C Typical Output Characteristics(I)

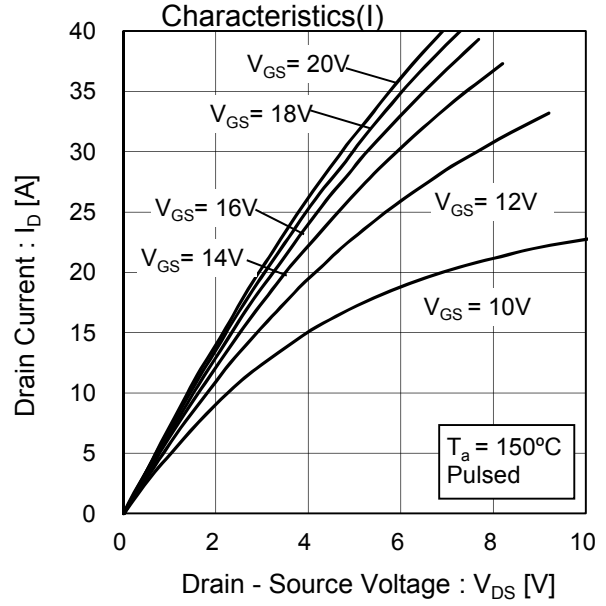
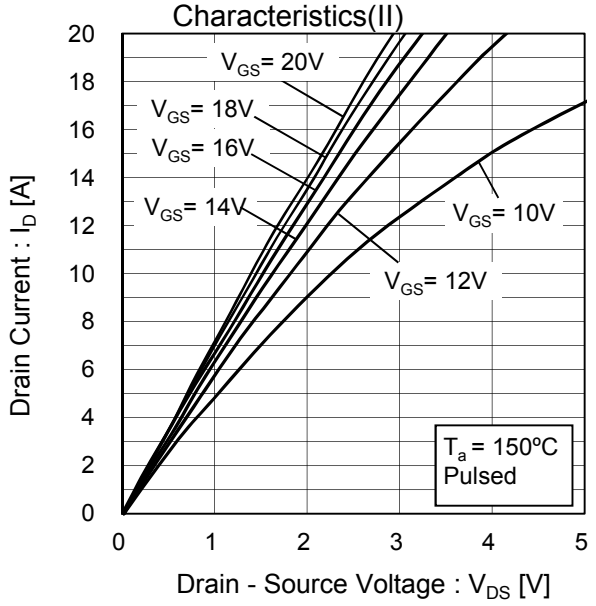


Fig.7 T_j = 150°C Typical Output Characteristics(II)



●電気的特性曲線

Fig.8 Typical Transfer Characteristics

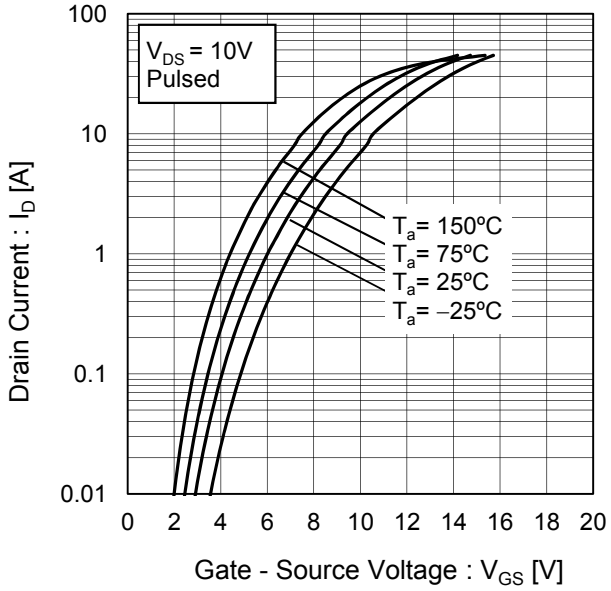


Fig.9 Gate Threshold Voltage vs. Junction Temperature

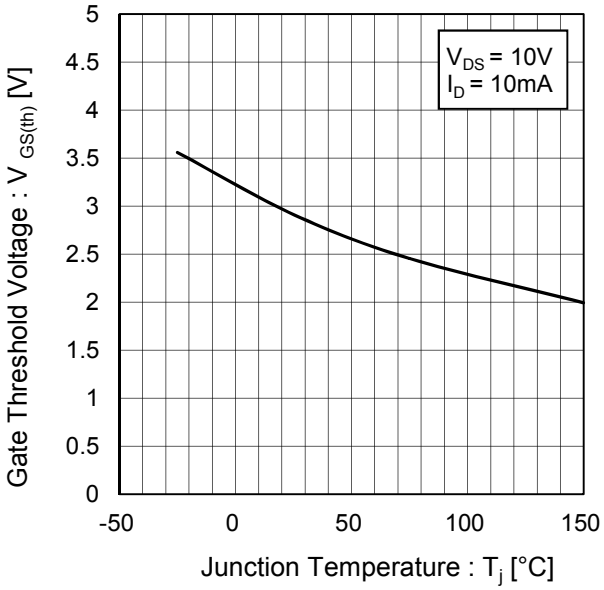
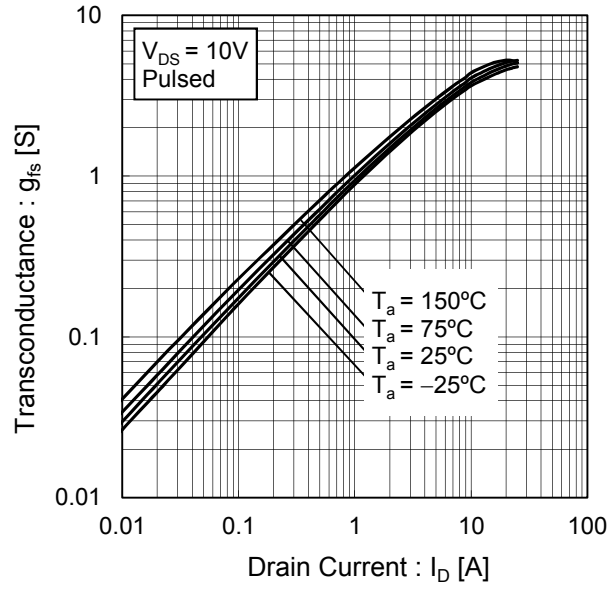


Fig.10 Transconductance vs. Drain Current



●電気的特性曲線

Fig.11 Static Drain - Source On - State Resistance vs. Gate - Source Voltage

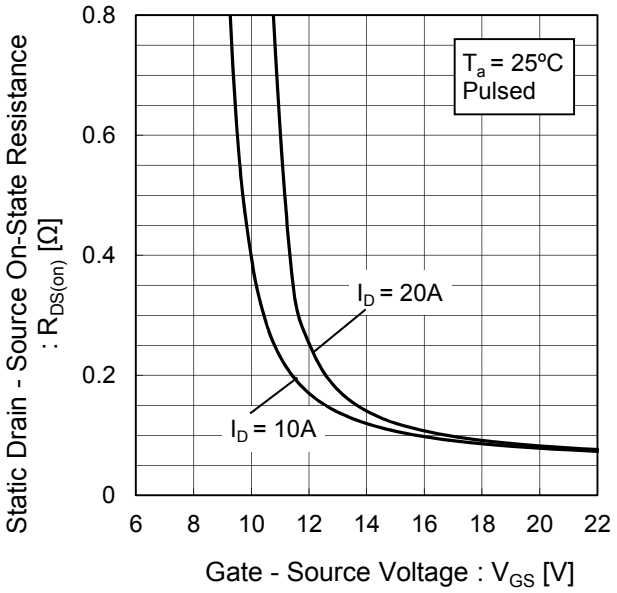


Fig.12 Static Drain - Source On - State Resistance vs. Junction Temperature

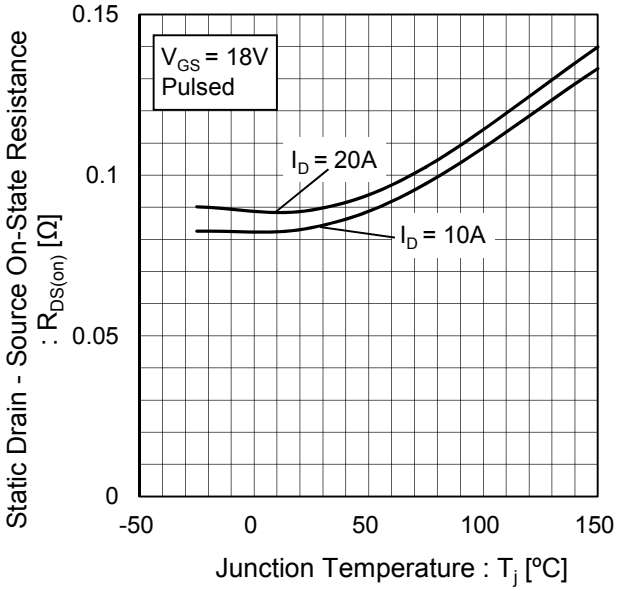
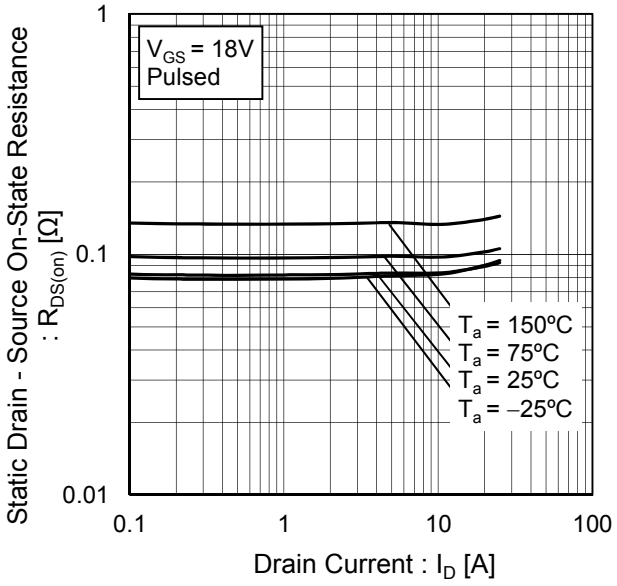


Fig.13 Static Drain - Source On - State Resistance vs. Drain Current



●電気的特性曲線

Fig.14 Typical Capacitance vs. Drain - Source Voltage

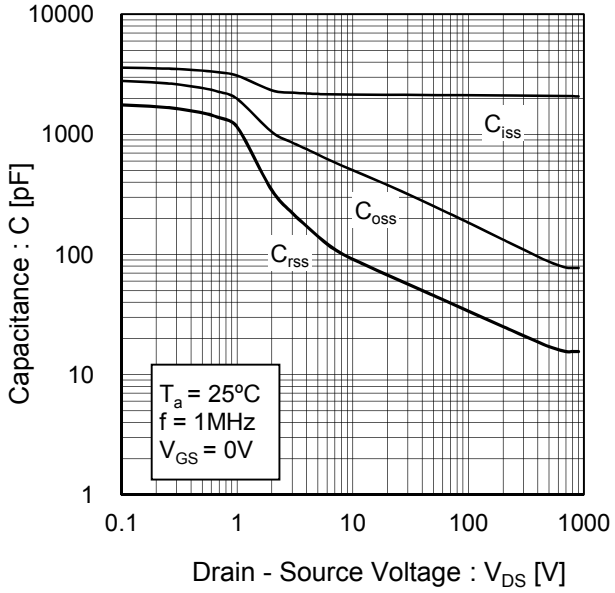


Fig.15 Coss Stored Energy

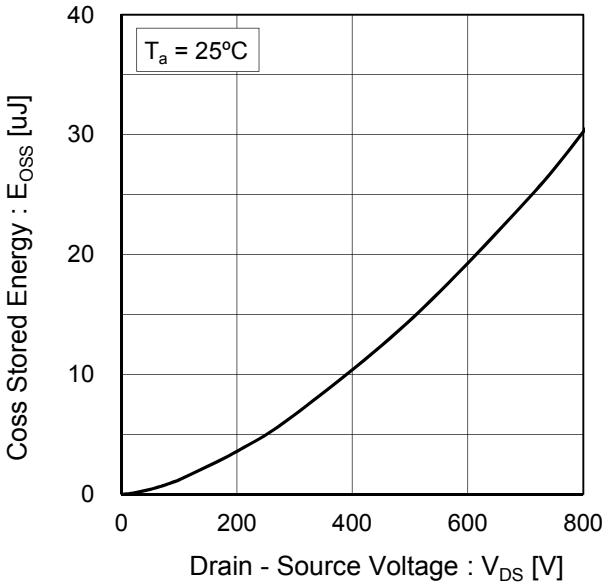


Fig.16 Switching Characteristics

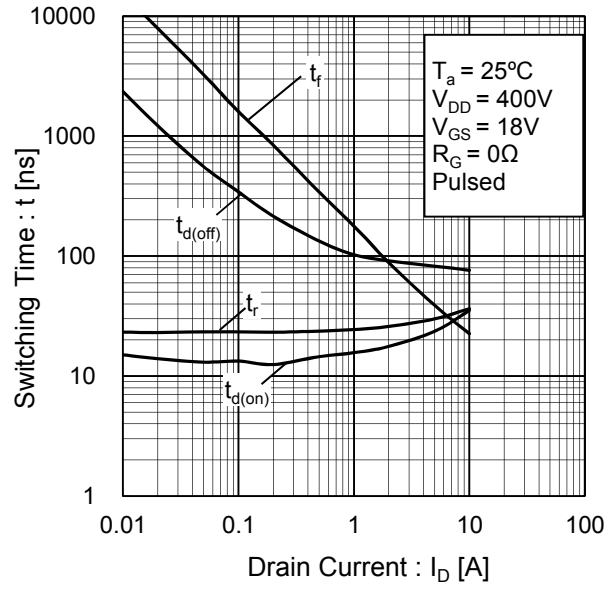
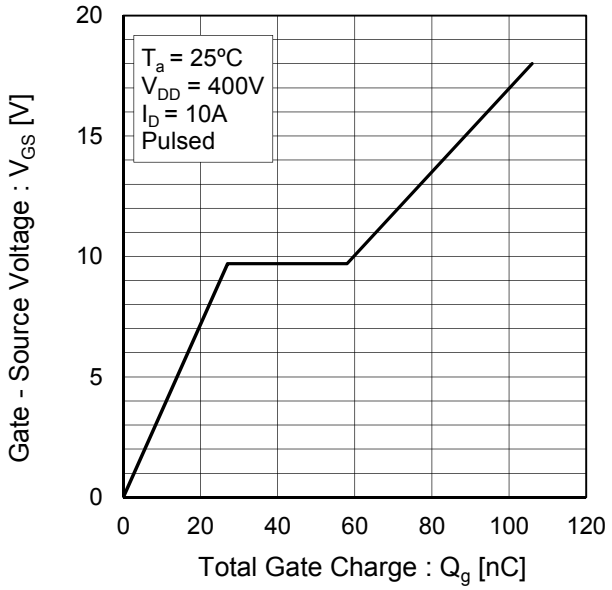


Fig.17 Dynamic Input Characteristics



●電気的特性曲線

Fig.18 Inverse Diode Forward Current vs. Source - Drain Voltage

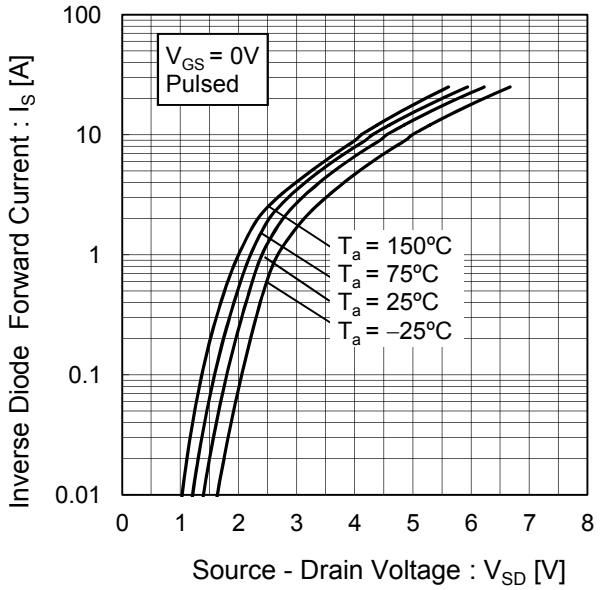
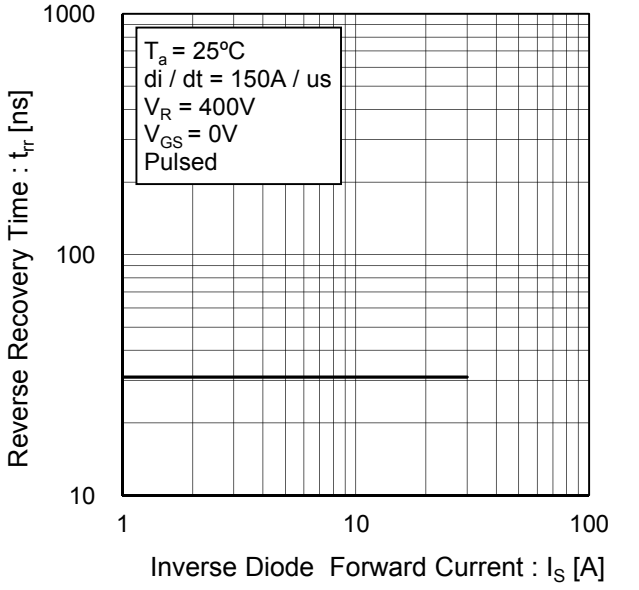


Fig.19 Reverse Recovery Time vs.Inverse Diode Forward Current



●測定回路図

Fig.1-1 スイッチング時間測定回路

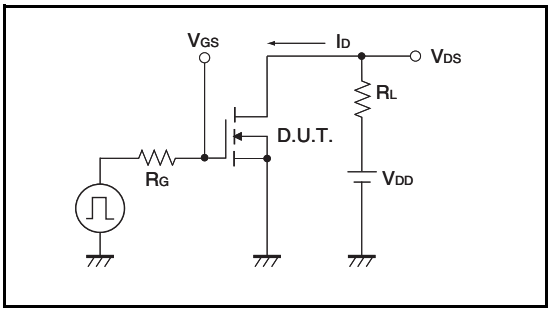


Fig.1-2 スイッチング波形

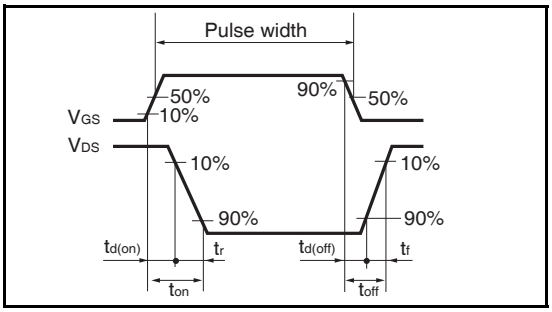


Fig.2-1 ゲート電荷量測定回路

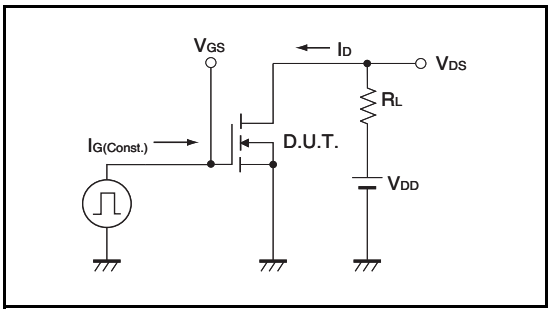


Fig.2-2 ゲート電荷量波形

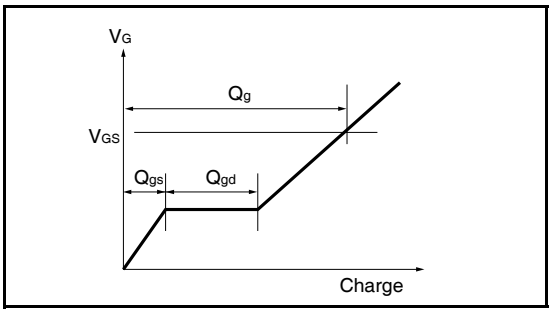


Fig.3-1 di/dt 測定回路

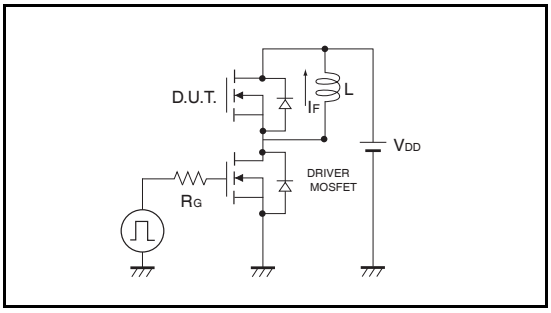
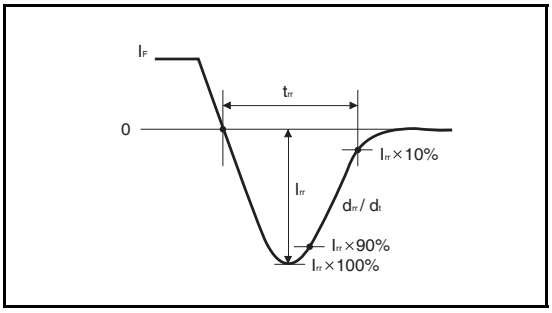
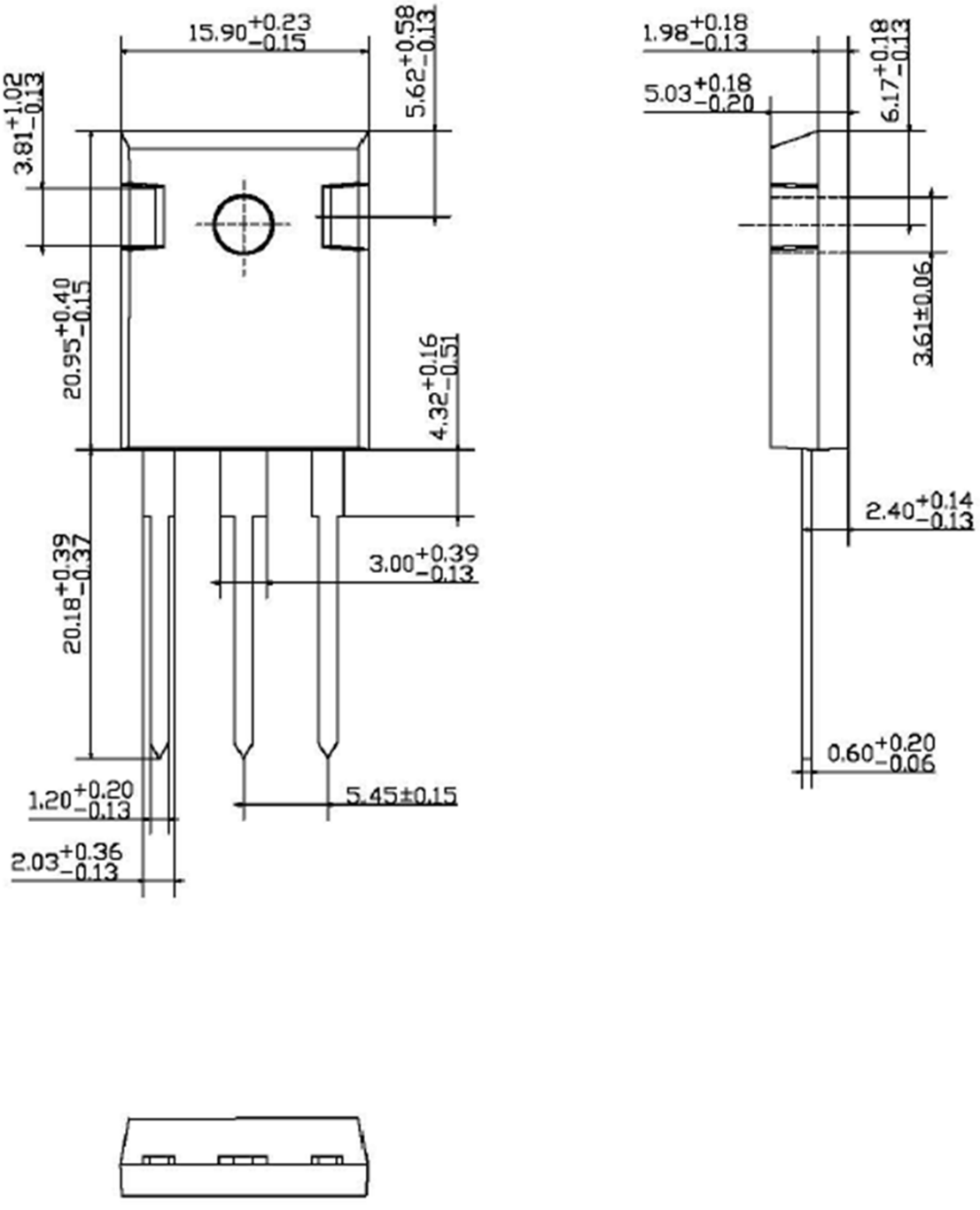


Fig.3-2 di/dt 波形



●**外形寸法図** (Unit : mm)

TO-247



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