TO-252 SiC N MOS

SiC N-CHANNEL MOSFET in a TO-252 Plastic Package.

V_{DS}=650V f S „ 9 G Ñ • † (e

/ Absolute Maximum Ratings(Tc=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	650	V
Continuous DC Drain Current for $R_{th(j-c,typ.)}$, Limited by $T_{VJ(max)}$	I_D(Tc=25)	20	A
	I_D(Tc=100)	14.4	A
Peak Drain Current, tp Limited by $T_{VJ(max)}$	I_{DM}	34.5	A
Gate-Source Max Voltage	$V_{GS,max}$	-10/+22	V
Gate-Source Operate Voltage	$V_{GS,op}$	0/+15	V
Single Pulse Avalanche Energy	E_{AS}	28	mJ
Power Dissipation or $R_{th(j-c,typ.)}$	P_D(Tc=25)	82	W
Operating and Storage Temperature Range	T_{VJ},T_{STG}	-55 to 175	
MOSFET/Body Diode Junction-Case Thermal Resistance	$R_{th(j-c)}$	1.83	/W

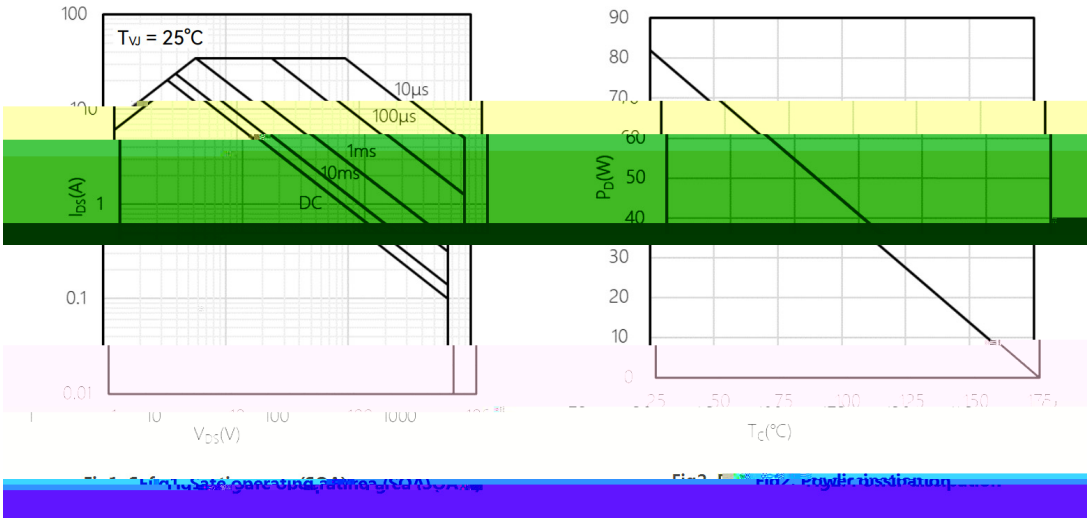
/ Electrical Characteristics(Tc=25)

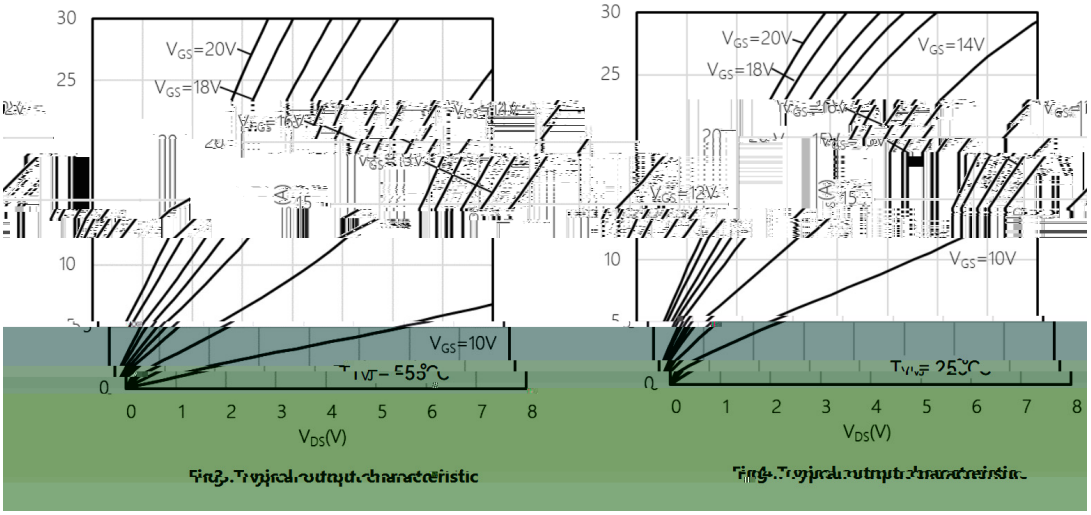
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=100μA	650			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=3.5mA	3		5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=650V V_{GS}=0V		0.1	20	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=22V V_{DS}=0V			250	nA
Source-Gate Leakage Current	I_{SGS}	V_{GS}=-10V V_{DS}=0V			250	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=15V I_D=10A		160	208	mΩ
		V_{GS}=15V I_D=10A T_{VJ}=175		164		
		V_{GS}=18V I_D=10A		124	180	
		V_{GS}=18V I_D=10A T_{VJ}=175		150		
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V I_S=5A		3.5		V
Continuous DC Source Current	I_S			17		A
Peak Reverse Drain Current,	I_{SM}			32		A
Reverse Recovery Time	t_{rr}	V_{GS} = 0V, I_{SD}=10A, V_R=400V, di/dt=1.5kA/us		6.9		ns
Reverse Recovery Charge	Q_{rr}			26		nC
Peak Reverse Recovery Current	I_{rrm}			4.8		A
Reverse Recovery Energy	E_{rr}			0.24		μJ

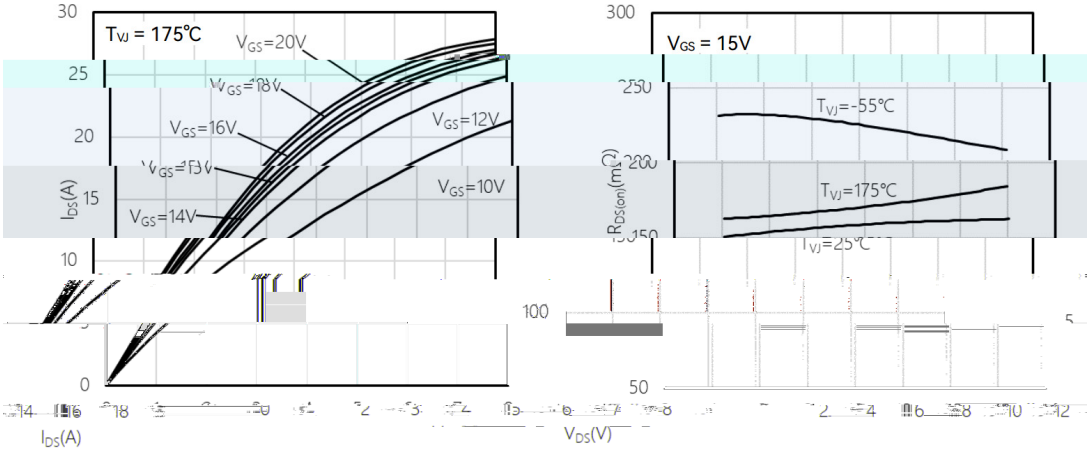
/ Electrical Characteristics(Tc=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=0/15V L=600μH V_{DD}=400V I_D=10A R_g=2.2		21.2		ns
Turn-On Rise Time	t_r			14.4		
Turn-Off Delay Time	$t_{d(off)}$			27.0		
Turn-Off Fall Time	t_f			14.2		
Turn−On Switching Loss	E_{on}			106		μJ
Turn−Off Switching Loss	E_{off}			24		
Total Switching Energy	E_{tot}			130		
Gate resistance	R_g	V_{AC}=25mV f=1MHz		28.5		Ω
Input Capacitance	C_{iss}	V_{DS}=400V V_{GS}=0V f=1MHz		438		pF
Output Capacitance	C_{oss}			30		
Reverse Transfer Capacitance	C_{rss}			2.7		
Total Gate Charge	Q_g	V_{GS}=0/15V, V_{DS}=400V, I_D=10A		14.5		nC
Gate Source Charge	Q_{gs}			5.5		
Gate Drain Charge	Q_{gd}			2.2		

/ Electrical Characteristic Curve





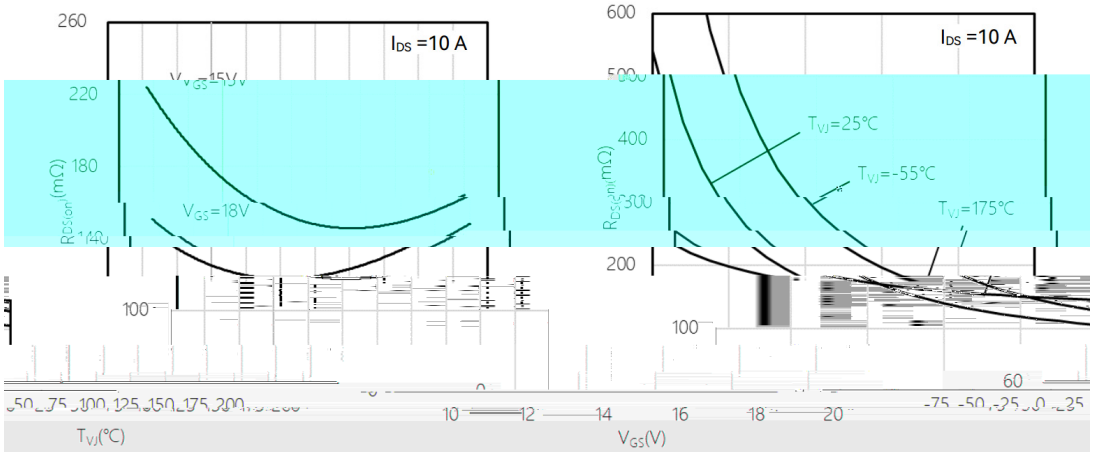


l on-state resistance as a n of drain current

Fig5. Typical output characteristic

Fig6. Typica functio

/ Electrical Characteristic Curve



ypical on-state resistance as a nction of temperature

Fig8. Typical on-state resistance as a function of VGS

Fig7. Ty fu

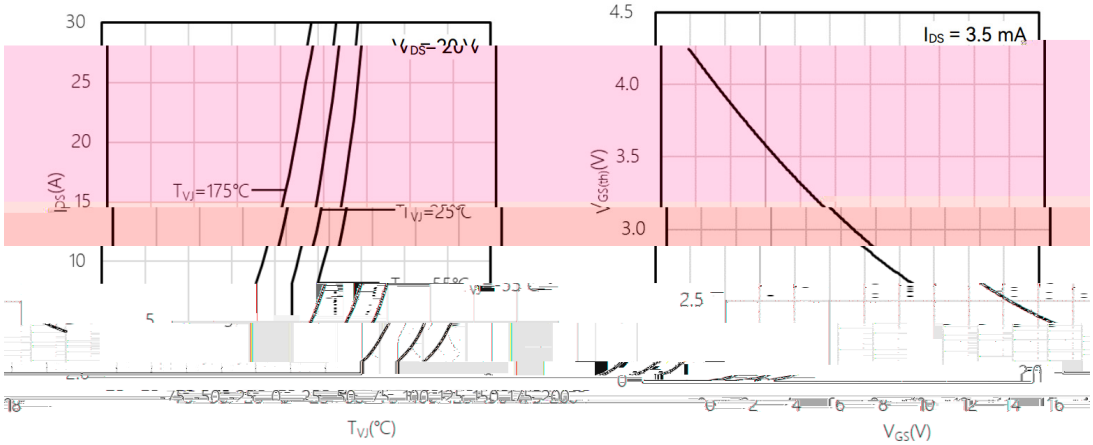


Fig10. Typical gate-source threshold voltage as a function of junction temperature

Fig9. Typical transfer characteristic

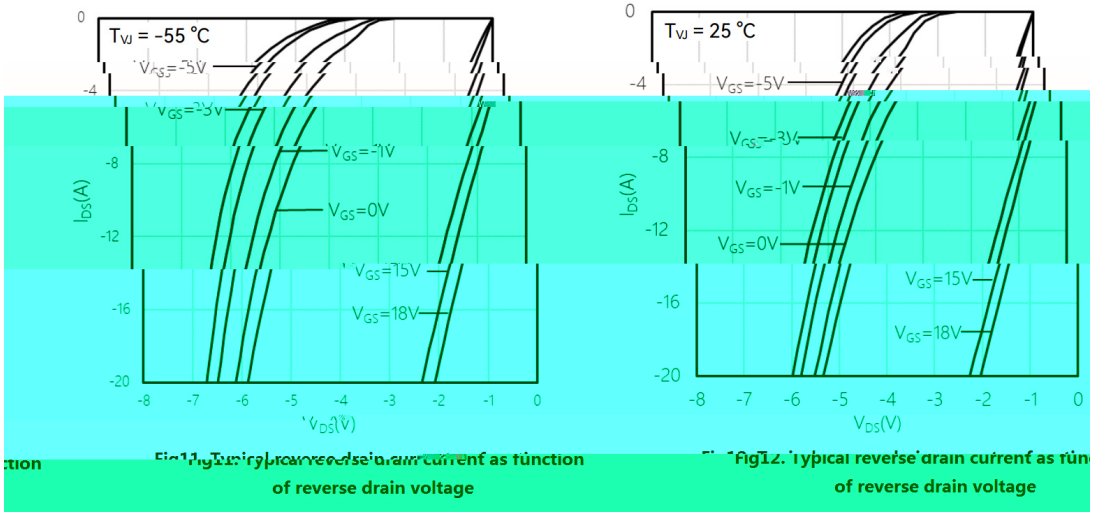


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Fig11. Typical reverse drain current as function of reverse drain voltage

Fig12. Typical reverse drain current as fun of reverse drain voltage

/ Electrical Characteristic Curve

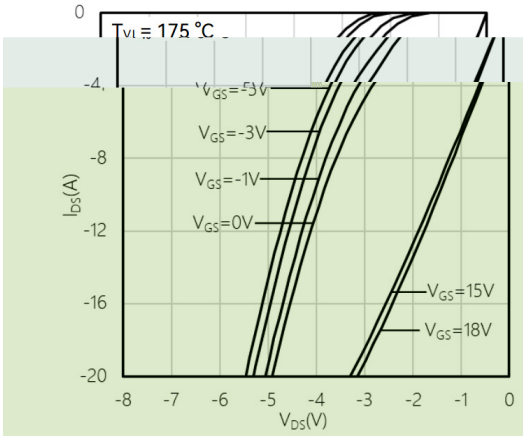


Fig13. Typical reverse drain current as function of reverse drain voltage

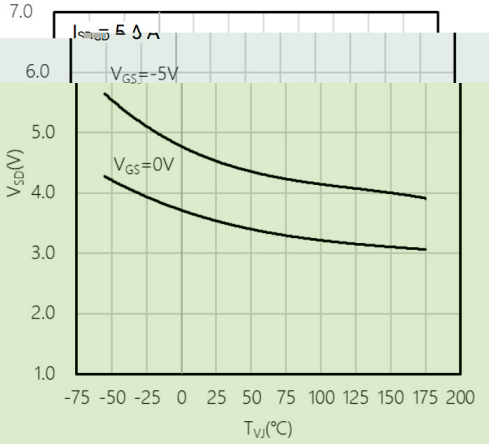
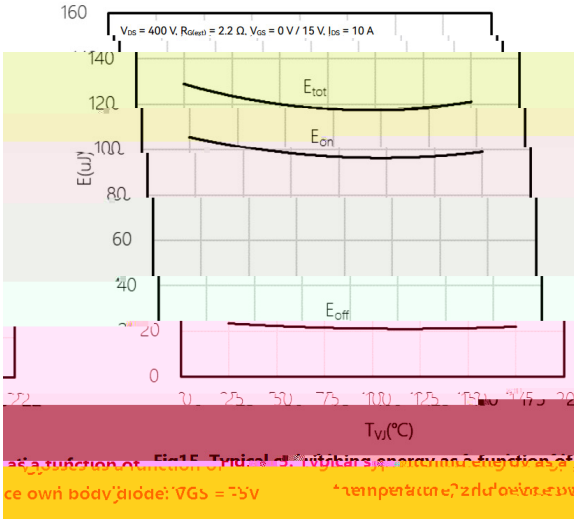
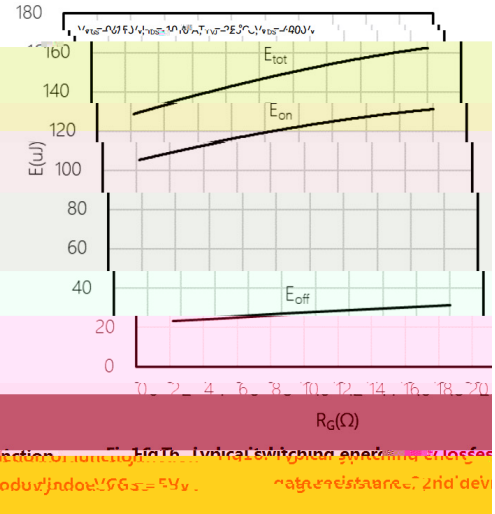
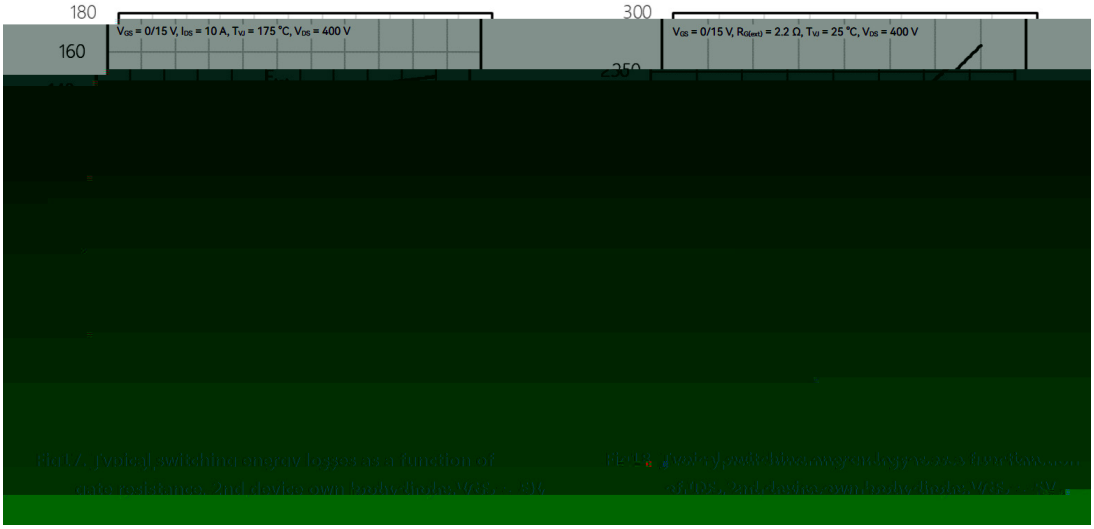


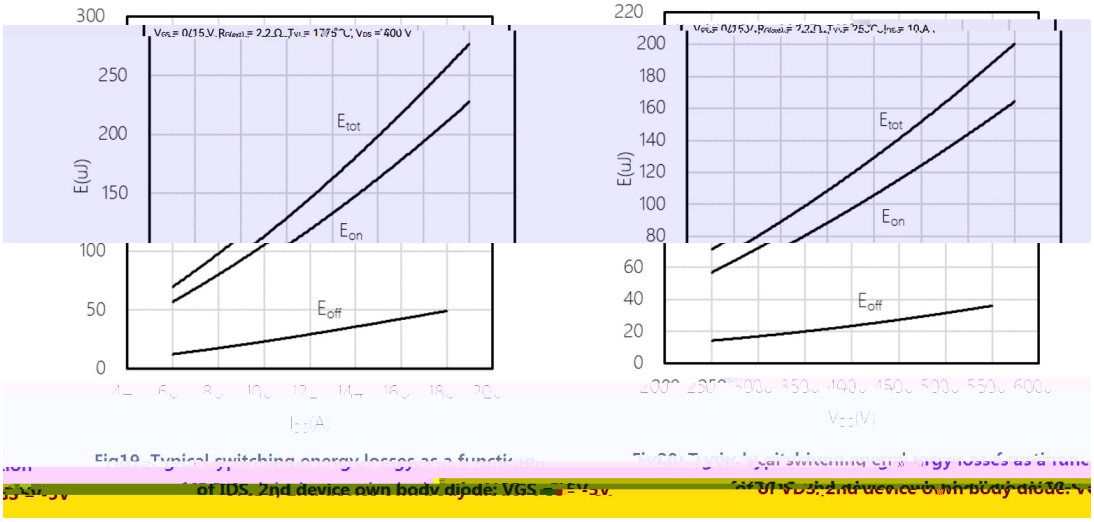
Fig14. Typical reverse drain voltage as function of junction temperature



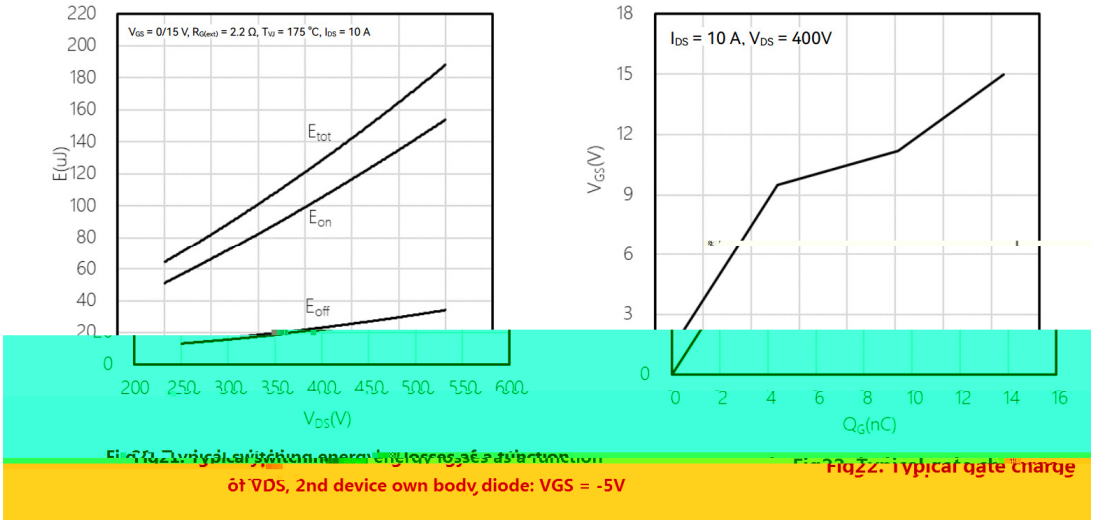




/ Electrical Characteristic Curve



of IDS, 2nd device own body diode: VGS = -5V



of VDS, 2nd device own body diode: VGS = -5V

Fig22: Typical gate charge

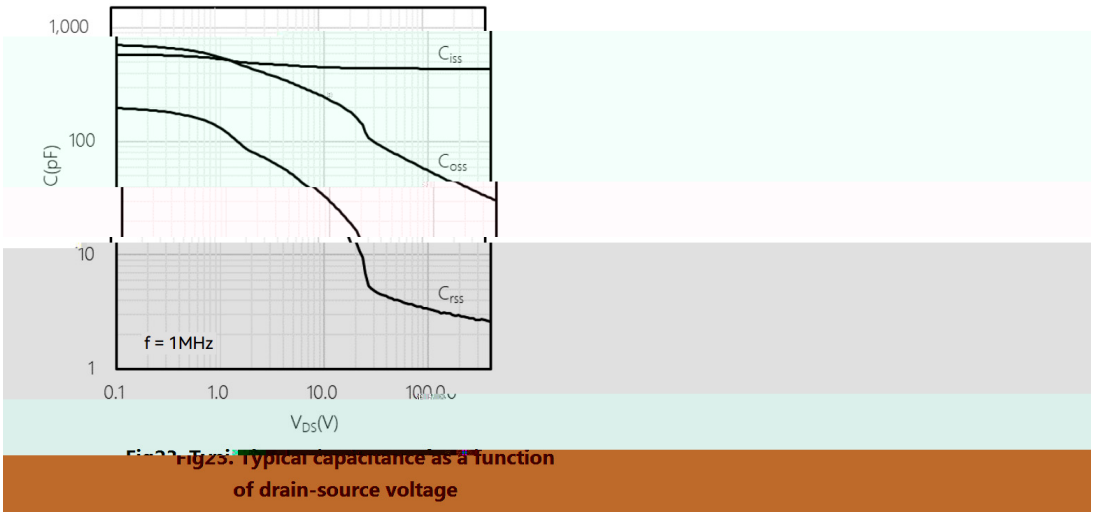


Fig23: Typical capacitance as a function of drain-source voltage

/ Electrical Characteristic Curve

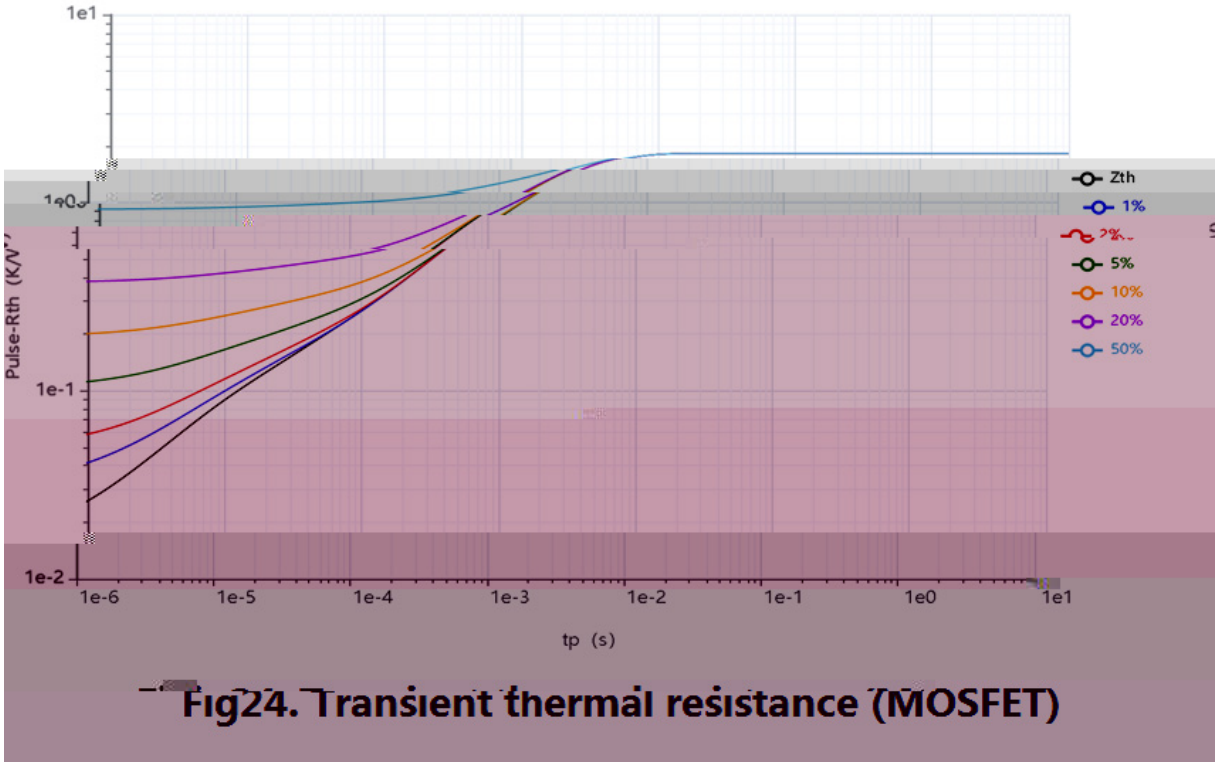
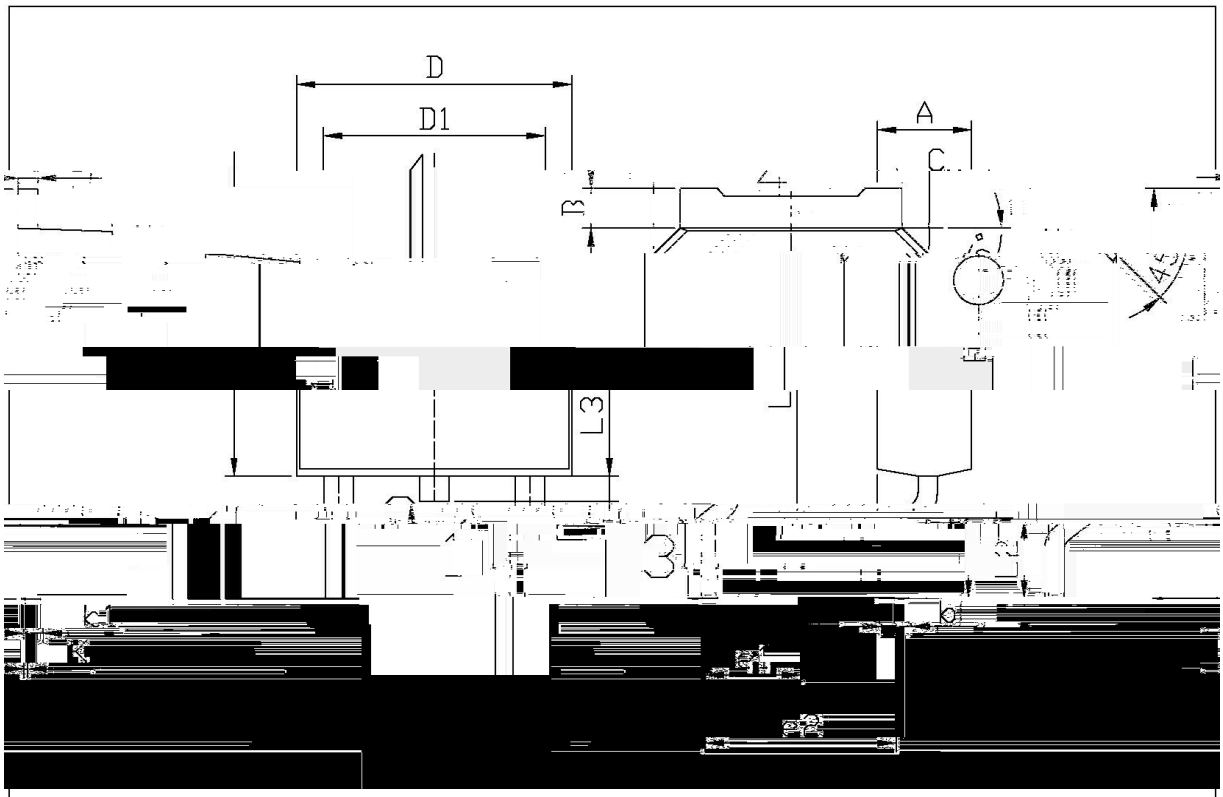


Fig24. Transient thermal resistance (MOSFET)

/ Package Dimensions

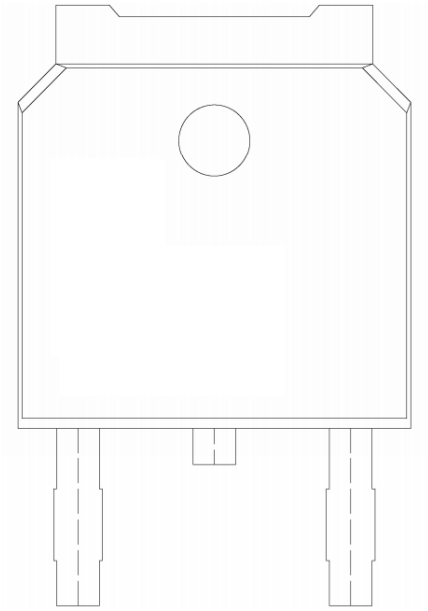


单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
	5.95	6.25		2.20	2.40
e1	2.24	2.34	B		0.95
					0.70
L	0.55	9.85	L1	10.35	0.45
		0.55	L2	1.70	2.00
D3	0.60	0.90	D	6.45	6.75
K	0.00	0.10	D1	5.10	5.50

-252 TO

/ Marking Instructions



BR

65R180Z

SC

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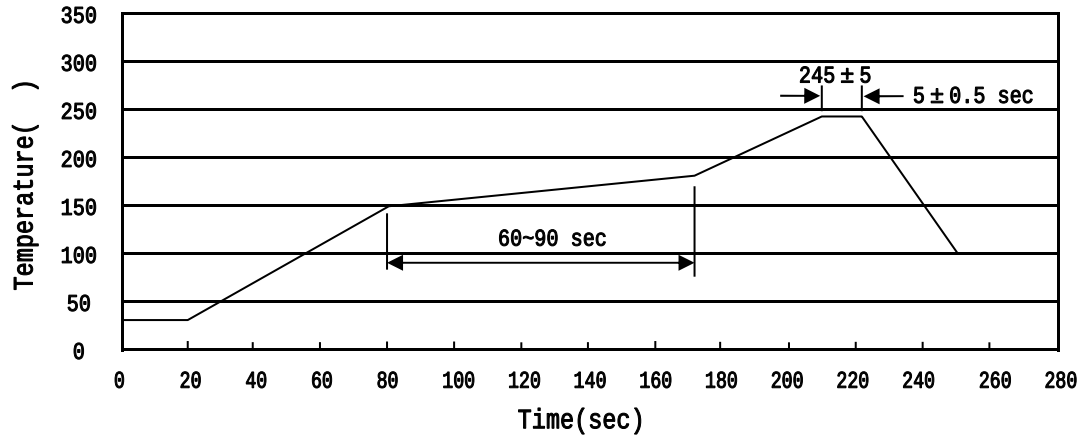
Note:

BR: Company Code

( ) / Temperature Profile for IR Reflow Soldering(Pb-Free)



						Note:	
1		150	180		60 90sec;	1.Preheating:150~180 , Time:60~90sec.	
2		245±5			5±0.5sec;	2.Peak Temp.:245±5 , Duration:5±0.5sec.	
3				2 10	/sec.	3. Cooling Speed: 2~10 /sec.	

/ Resistance to Soldering Heat Test Conditions

260±5	10±1 sec.	Temp.:260±5	Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type	Units					Dimension		(unit mm³)
	Units/Reel /	Reels/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Reel	Inner Box	Outer Box
TO-252	2,500	2	5,000	6	30,000	13 ×16	360×360×50	380×335×366

/ TUBE

Package Type	Units					Dimension		(unit mm³)
	Units/Tube /	Tubes/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Tube	Inner Box	Outer Box
TO-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

/ Notices

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