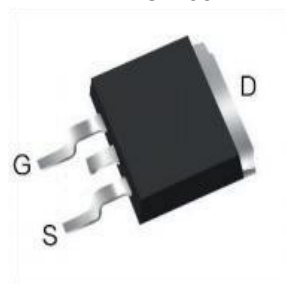




1.Features

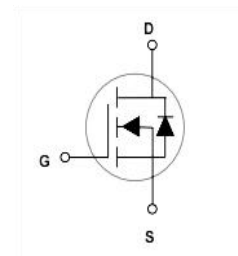
- V_{DS} 650V
- I_D 40A
- $R_{DS(on)}$ (at $V_{GS}=10V$) 83m Ω (Typ)

TO-263



2.Mechanical Data

- Case:Molded Plastic,TO-263;
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking: marked on body.
- Mounting Position : Any.



3.Maximum Ratings and Electrical Characteristics

Electrical Characteristics (T_J=25°C unless otherwise noted)

Characteristics		Symbol	Ratings		Unit
Drain-Source Voltage		V _{DS}	650		V
Gate-Source Voltage(DC)		V _{GS}	±30		V
Drain Current-Continuous	T _C =25°C	I _D	40		A
	T _C =100°C		25		
Maximum Power Dissipation		P _D	277		W
Single Pulsed Avalanche energy		E _{AS}	902		mJ
Junction and Storage Temperature Range		T _J , T _{stg}	-50\to +150		°C
Thermal Characteristics					
Parameter		Symbol	Typ	Max	Unit
Thermal Resistance, Junction-to-Case		R _{θJC}	-	0.48	°C/W
Thermal Resistance, Junction-to-Ambient		R _{θJA}	-	62	°C/W



Characteristics	Symbol	Test conditions	Min	TYP	Max	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V,I _D =250μA	650	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 600V,V _{GS} = 0V	-	-	10	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±21V,V _{DS} = 0V	-	-	100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	2	3	4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A	-	83	93	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{iss}	V _{DS} =25V	-	2900	-	pF
Output Capacitance	C _{oss}	f=1.0MHZ	-	196	-	
Reverse Transfer Capacitance	C _{rss}	Level=0.5V	-	4.97	-	
SWITCHING PARAMETERS						
Turn-on Delay Time	t _{d(on)}	V _{DS} =400V, V _{GS} =10V R _L =2Ω; I _D =20A	-	24.9	-	nS
Turn-on Rise Time	t _r		-	57.9	-	
Turn-off Delay Time	t _{d(off)}		-	84.1	-	
Turn-off Fall Time	t _f		-	17	-	
Total Gate Charge	Q _g	V _{DS} =400V, I _D =20A V _{GS} =10V , L = 250μH	-	67.3	-	nC
Gate-Source Charge	Q _{gs}		-	13.1	-	
Gate-Drain Charge	Q _{gd}		-	25.2	-	
Diode forward voltage *3	V _{SD}	I _{SD} =29A,V _{GS} =10Vdi/dt = 100A/ μs Lσ = 50nH, Cσ = 10pF	-	0.8	1.2	V
Reverse recovery time *3	trr		-	345	-	nS
Reverse recovery charge *3	Qrr		-	6	-	μC



4. Rating And Characteristic Curves

Fig.1 Drain to Source Resistance vs. Gate to Source Voltage

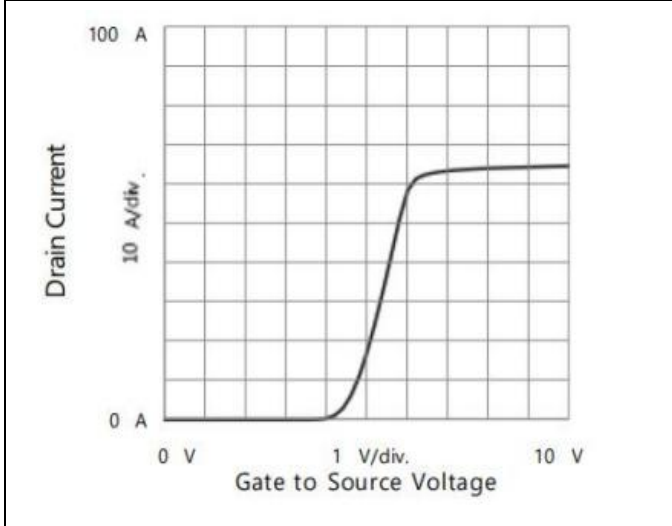


Fig.2 Drain-source on-state resistance

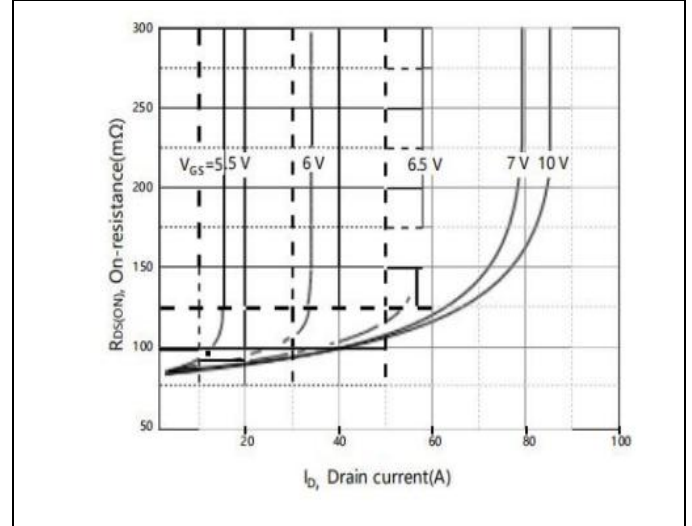


Fig.3 Body Diode Forward Characteristics

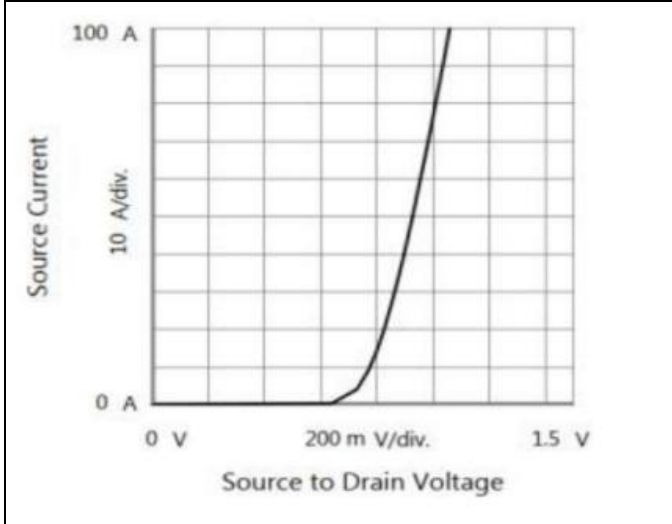


Fig.4 Gate Charge Characteristics

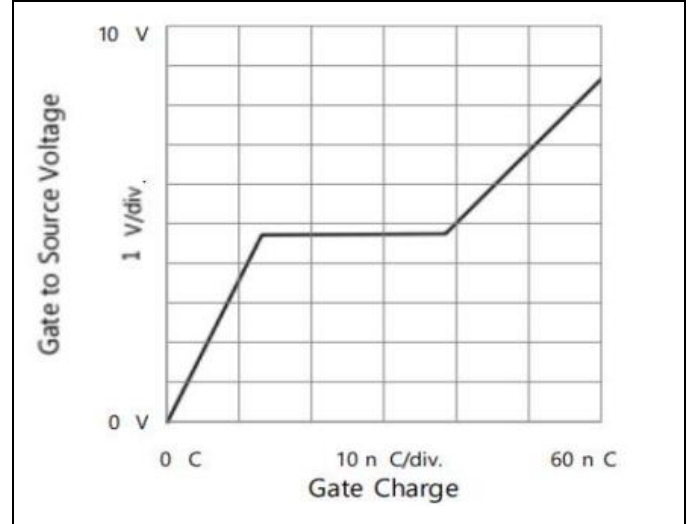


Fig.5 Forward characteristic of body diode

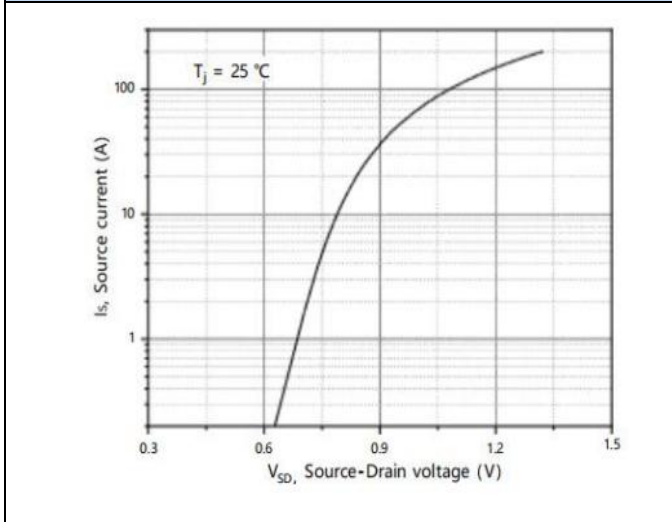


Fig.6 Drain to Source Resistance vs. Gate to Source Voltage

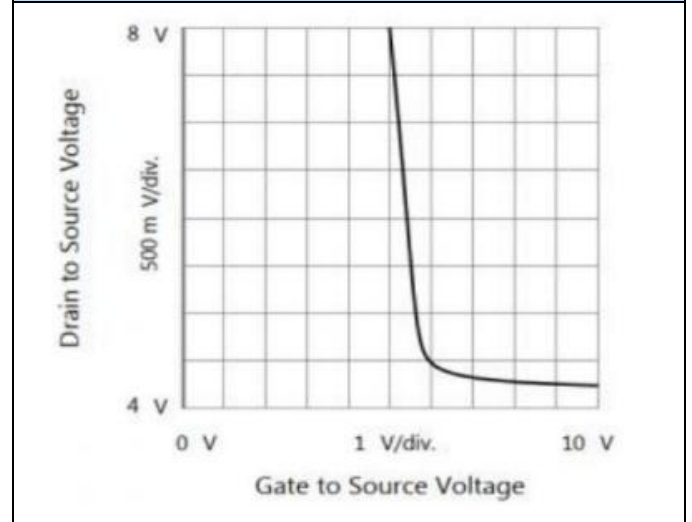




Fig.7 Drain to Source Resistance vs.Gate to Source Voltage

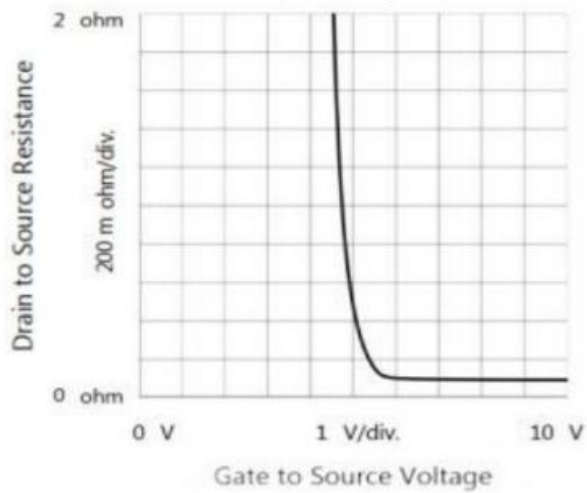


Fig.8 Drain current

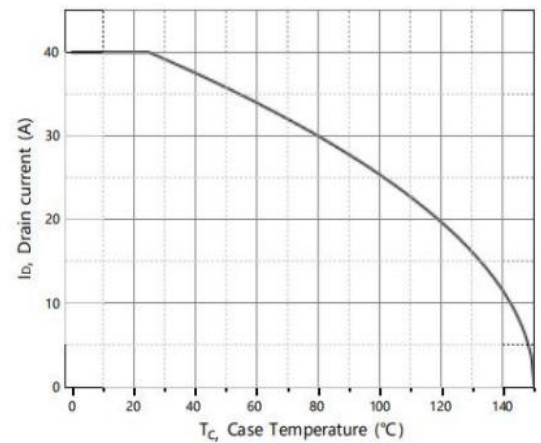


Fig.9 Safe Operating Area

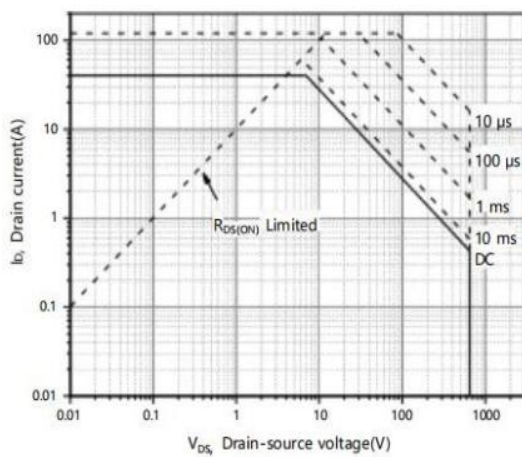


Fig.10 Gate Charge Measurement Circuit

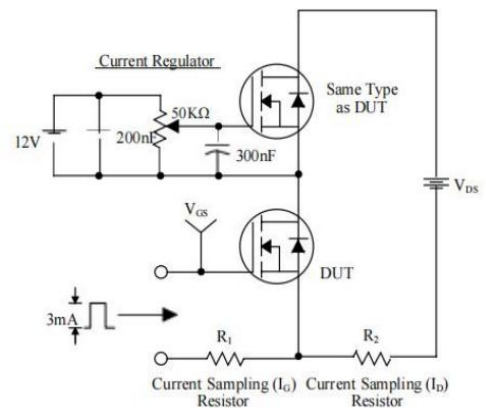


Fig.11 Gate Charge Measurement Circuit

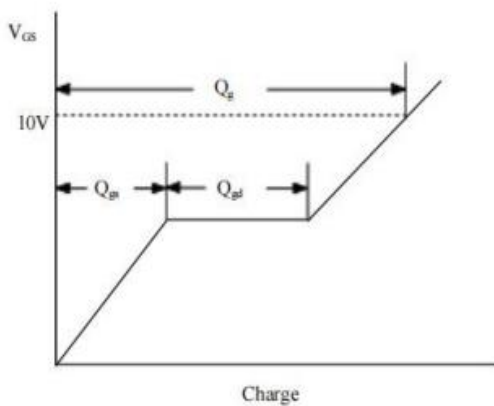


Fig.12 Switching Characteristics Measurement Circuit

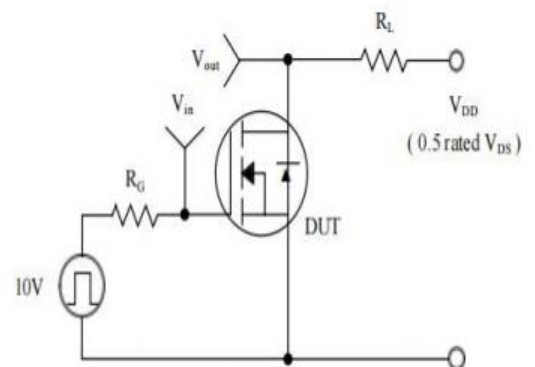




Fig.13 Waveforms for Switching Time

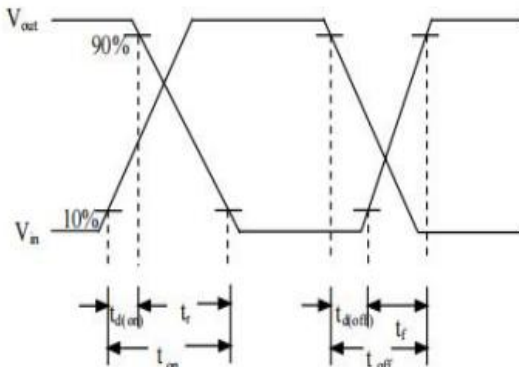


Fig.14 Waveforms for Switching Energy Loss

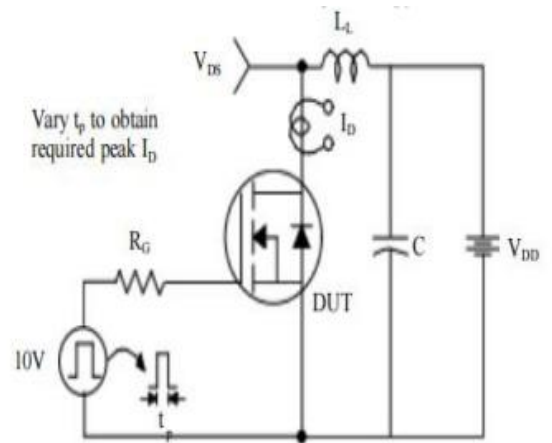


Fig.15 Reverse Recovery Time Measurement Circuit

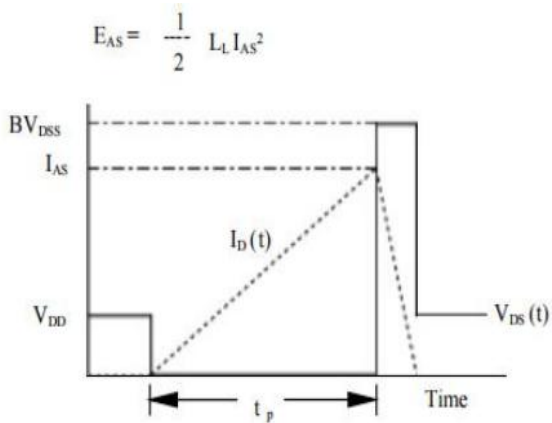
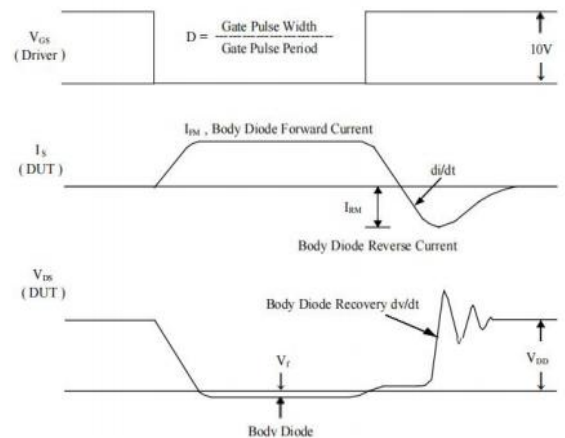


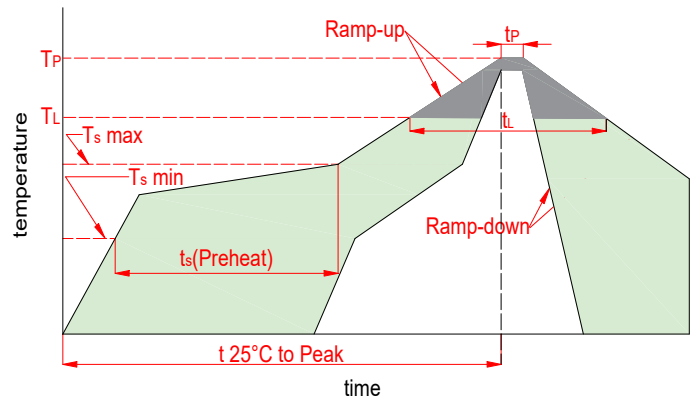
Fig.16 Reverse Recovery Waveform



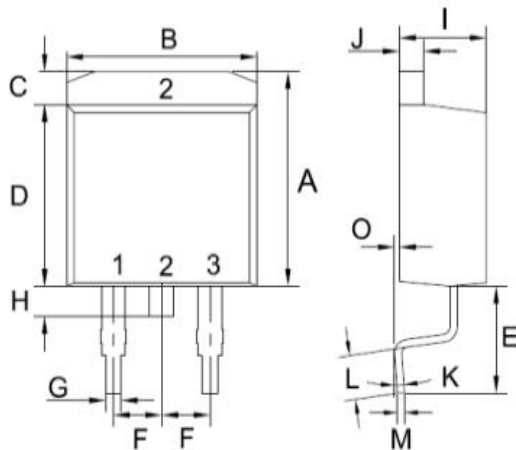


5. Rating And Characteristic Curves

Reflow Condition		Lead-free
Pre Heat	Temp. min($T_{s(min)}$)	150°C
	Temp. max($T_{s(min)}$)	200°C
	Time(min to max)(t_s)	60~180s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3°C/s max
$T_s(max)$ to T_L -Ramp-up Rate		3°C/s max
Reflow	Temp.(T_L)(Liquidus)	217°C
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)		245 ^{+0/-5} °C
Time within actual peak Temp.(t_p)		30s max
Ramp-down Rate		6°C/s max
Time 25°C to peak Tempe.(T_p)		8 minutes max
Do not exceed		245°C

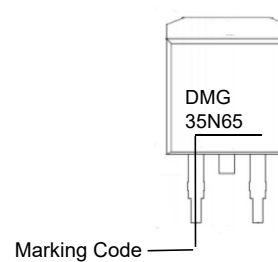
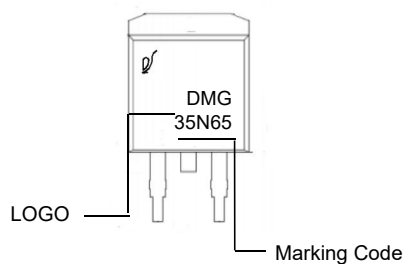


6. Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.370	0.433	9.40	11.00
B	0.386	0.402	9.80	10.20
C	0.039	0.055	1.00	1.40
D	0.354	0.370	9.00	9.40
F	0.092	0.108	2.34	2.74
G	0.024	0.040	0.61	1.01
H	0.028	0.063	0.70	1.60
I	0.167	0.193	4.25	4.90
J	0.042	0.058	1.07	1.47
L	0.078	0.112	1.99	2.84
M	0.016	0.024	0.40	0.60

7. Part Marking System





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