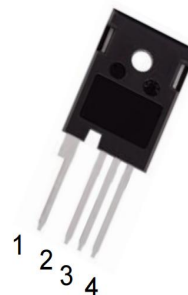




1.Features

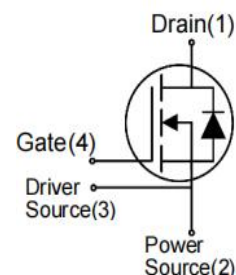
- V_{DS} 650V
- I_D 77A
- $R_{DS(ON)}$ 40 m Ω

TO-247-4



2.Mechanical Data

- Case:Molded Plastic,TO-247-4;
- 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

Rating at 25°C Cambient temperature unless otherwise specified

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	650	V
Drain Current Continuous	$T_C=25^{\circ}\text{C}$	I_D	77	A
	$T_C=100^{\circ}\text{C}$		55	
PeakDrain Current		I_{DM}	150	A
Gate-Source Voltage		V_{GSmax}	-8/+22	mJ
Recommend Gate-Source Voltage		V_{GSop}	-4/+18	V
Power Dissipation	$T_C=25^{\circ}\text{C}$	P_{tot}	283	W
	$T_C=100^{\circ}\text{C}$		141	
Maximum Junction Temperature		T_J	-40~175	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	-40~175	$^{\circ}\text{C}$
Thermal Resistance from Junction to Case		$R_{th(j-c)}$	0.55	$^{\circ}\text{C/W}$



Characteristics		Symbol	Test conditions	Min	TYP	Max	Unit
Static Characteristics							
Drain -Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0V,I _D =0.1mA	650	-	-	V
Zero Gate Voltage Drain Current		I _{DSS}	V _{DS} = 650V,V _{GS} = 0V	-	1	-	uA
Gate-Source Leakage Current		I _{GSS}	V _{GS} = 0V,V _{DS} =18V	-	-	250	nA
Gate Threshold Voltage	T _J =25°C	V _{GS (th)}	V _{GS} = V _{DS} , I _D =10μA	2.0	2.50	4.0	V
	T _J =150°C			-	1.63	-	
	T _J =175°C			-	1.60	-	
Drain-Source On-State Resistance	T _J =25°C	R _{DS(on)}	V _{GS} =18V, I _D =30A	-	36	-	mΩ
	T _J =175°C			-	43	-	
Dynamic Characteristics							
Input Capacitance	C _{iss}	V _{DS} =600V V _{GS} =0V f = 1MHz	-	2200	-	pF	
Output Capacitance	C _{oss}		-	200	-		
Reverse Transfer Capacitance	C _{rss}		-	14	-		
Total Gate Charge	Q _g	V _{DS} =400V, V _{GS} =-4/18V I _D =30A	-	113	-	nC	
Gate-Source Charge	Q _{gs}		-	29	-		
Gate-Drain Charge	Q _{gd}		-	43	-		
Switching Characteristics							
Turn-on Delay Time	t _{d(on)}	V _{DD} =400V, V _{GS} =4V/18V I _D =20A ,R _G = 2.5Ω	-	27	-	ns	
Turn-on Rise Time	t _r		-	21	-		
Turn-off Delay Time	t _{d(off)}		-	27	-		
Turn-off Fail Time	t _f		-	11	-		
Turn-On Energy	E _{on}		-	156	-		
Turn-Off Energy	E _{off}		-	21	-		
Drain-Source Diode Characteristics							
Diode Forward Voltage	T _J =25°C	V _{SD}	V _{GS} =-4V, I _{SD} =30A	-	5.6	-	V
	T _J =175°C			-	4.68	-	
Continuous Diode Forward Current	T _J =25°C	I _S	V _{GS} =-4V	-	45	-	A
	T _J =100°C			-	20	-	
Reverse Recovery Time	T _{rr}	V _{GS} =-4V, I _{SD} =20A, V _R =400V, di/dt=900A/μs,T _J =25°C	-	15	-	ns	
Reverse Recovery Charge	Q _{rr}		-	100	-	nC	
Peak reverse recovery current	I _{rrm}		-	13	-	A	



4. Rating And Characteristic Curves

Fig.1 Output Characteristics $T_j = -40^\circ\text{C}$

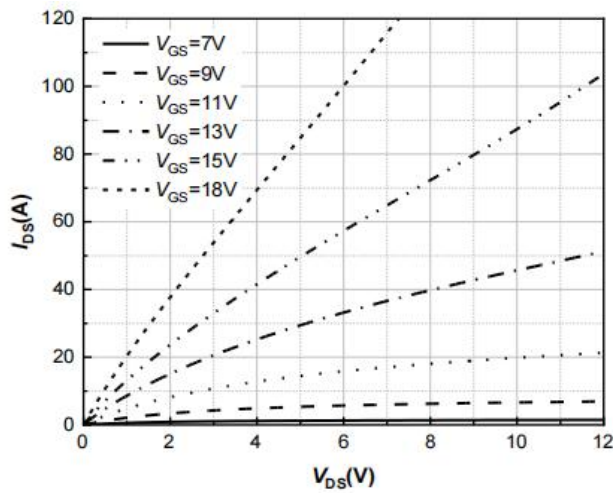


Fig.2 Output Characteristics $T_j = 25^\circ\text{C}$

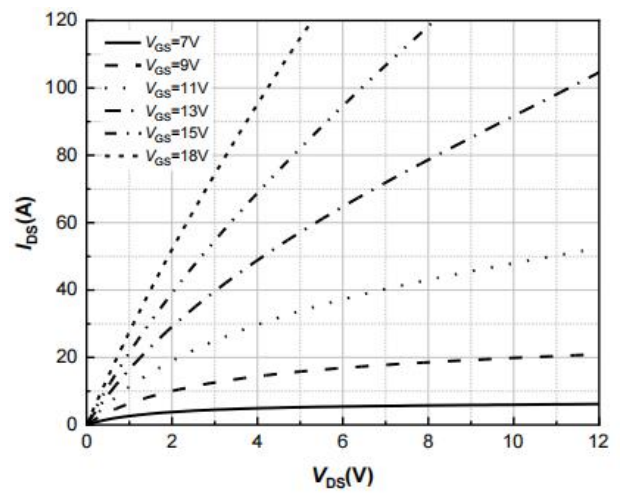


Fig.3 Output Characteristics $T_j = 175^\circ\text{C}$

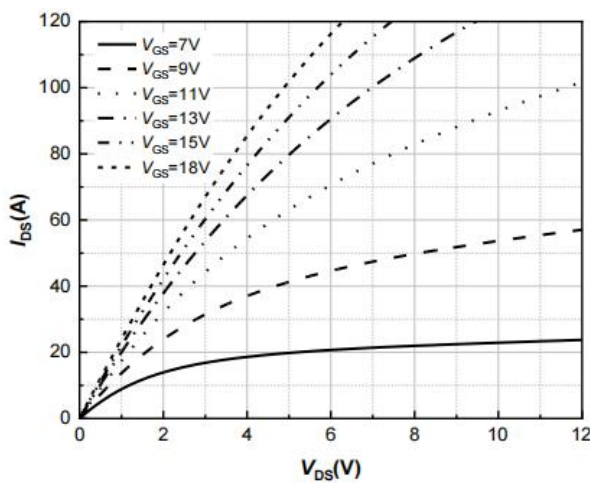


Fig.4 Normalized $R_{DS(on)}$ DS vs. Temperature

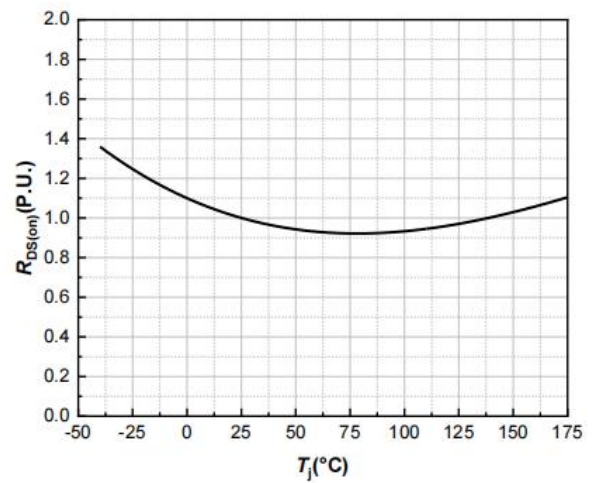


Fig.5 I_{DS} (A) VS $R_{DS(on)}$

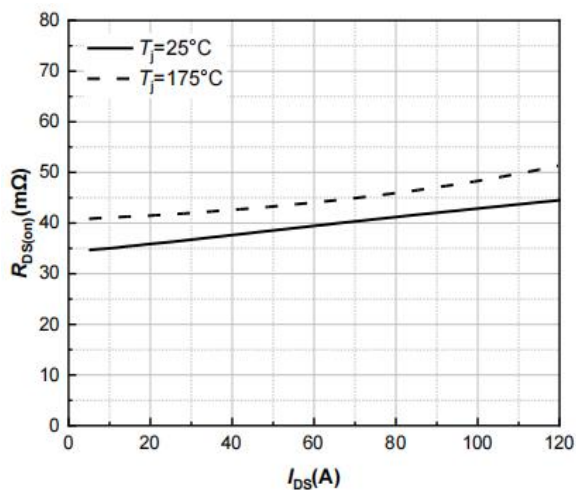


Fig.6 I_{DS} (A) VS T_j ($^\circ\text{C}$)

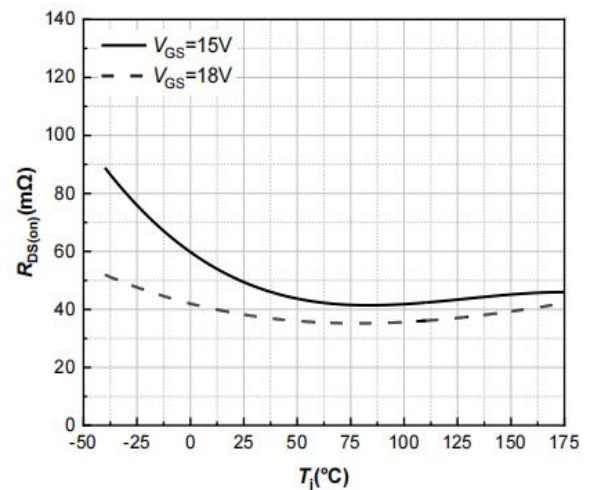




Fig.7 V_{GS} vs I_{DS} (A)

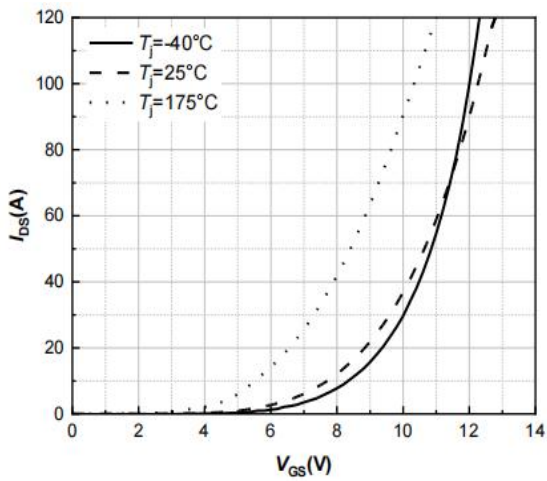


Fig.8 Body Diode Characteristic $T_j = -40^\circ\text{C}$

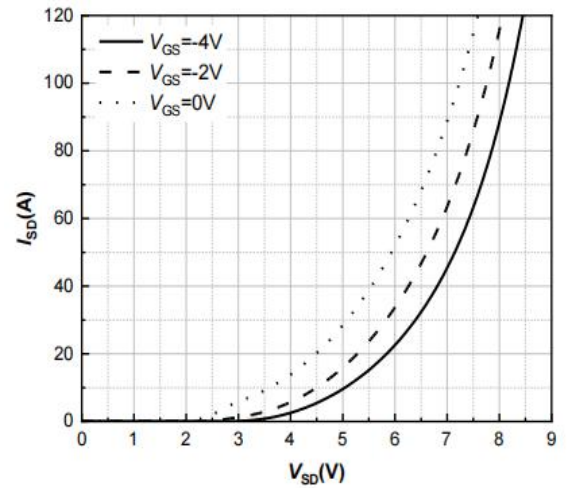


Fig.9 Body Diode Characteristic $T_j = 25^\circ\text{C}$

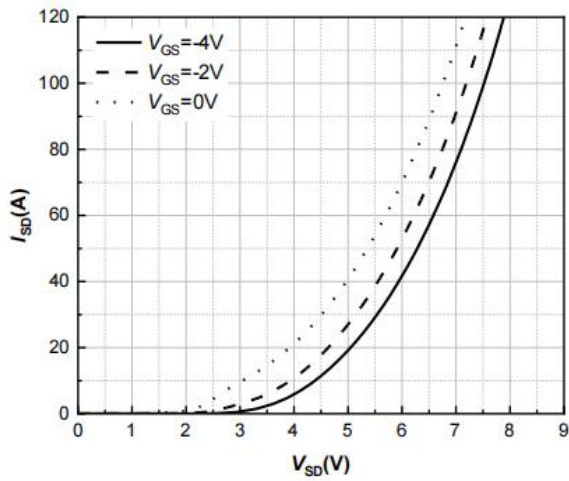


Fig.10 Body Diode Characteristic $T_j = 175^\circ\text{C}$

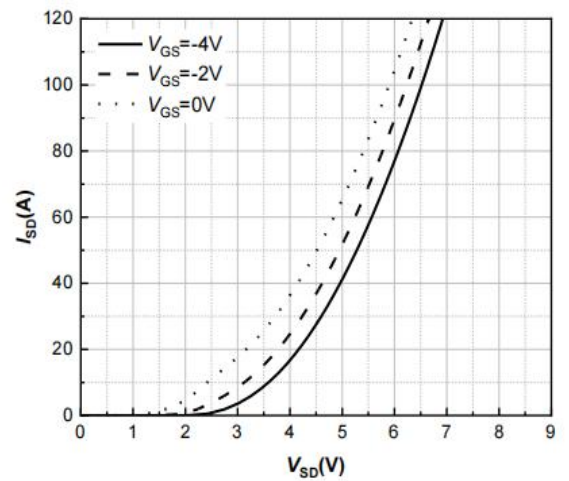


Fig.11 Threshold Voltage vs. Temperature

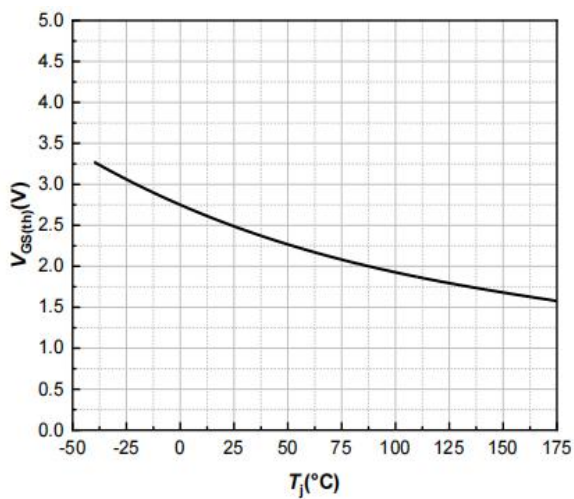


Fig.12 Gate Charge Characteristics

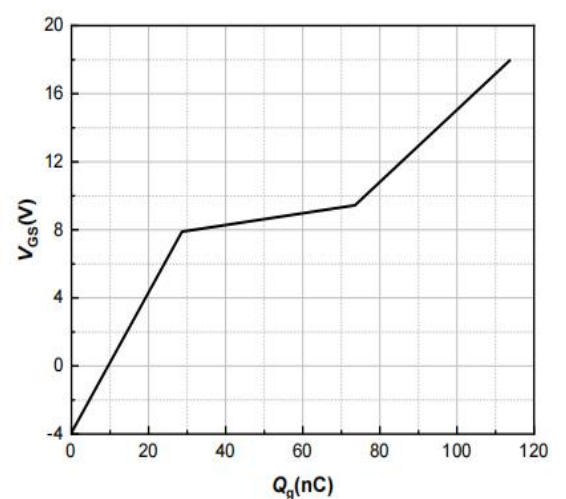




Fig.13 3rd Quadrant Characteristic $T_j = -40^\circ\text{C}$

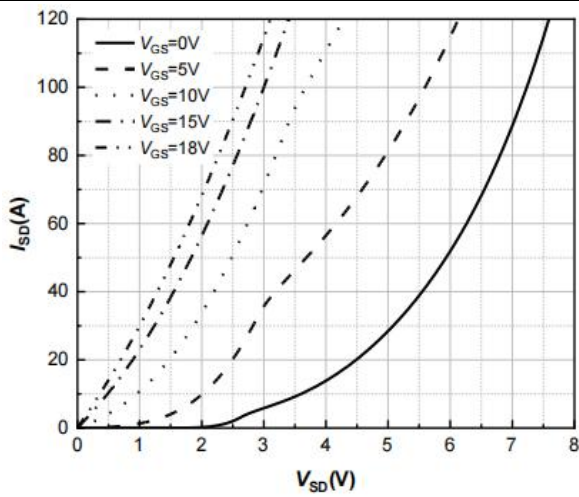


Fig.14. 3rd Quadrant Characteristic $T_j = 25^\circ\text{C}$

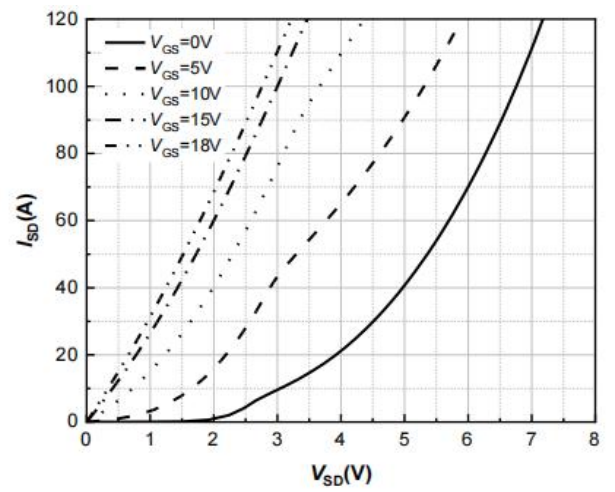


Fig.15 3rd Quadrant Characteristic

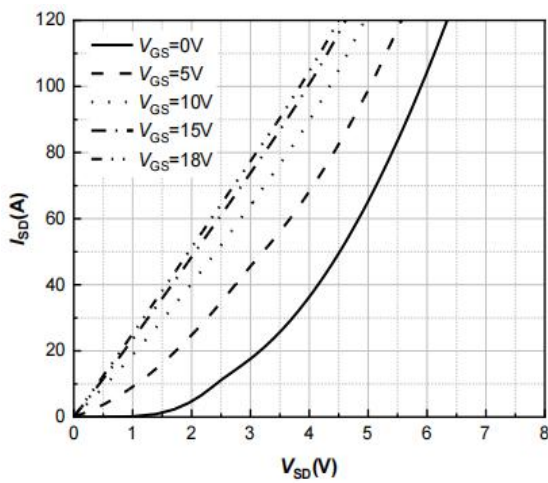


Fig.16 Output Capacitor Stored Energy

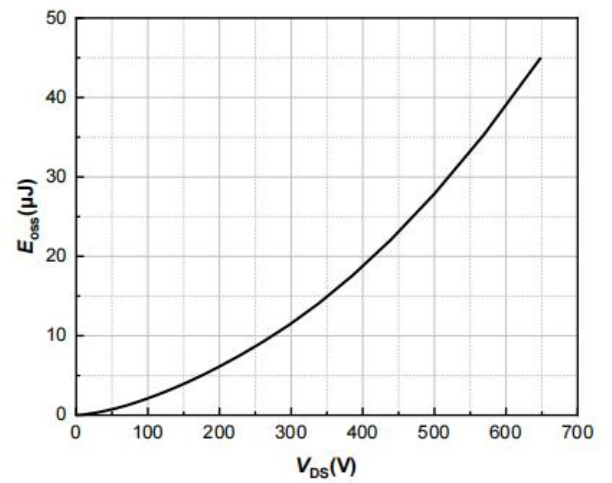


Fig.17 Capacitances vs. Drain-Source

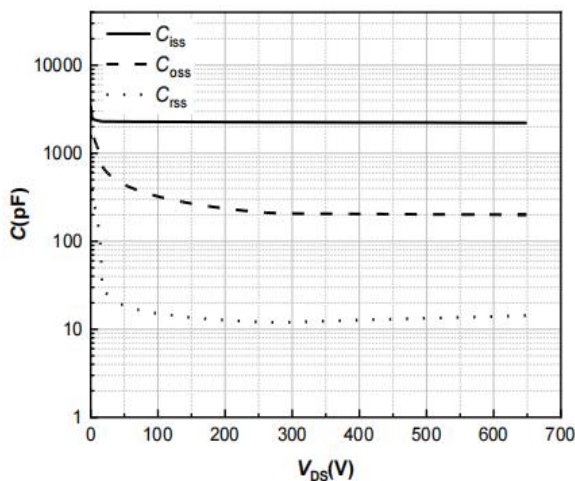


Fig.18 $I_{DS}(A)$ vs. $T_c(^{\circ}\text{C})$

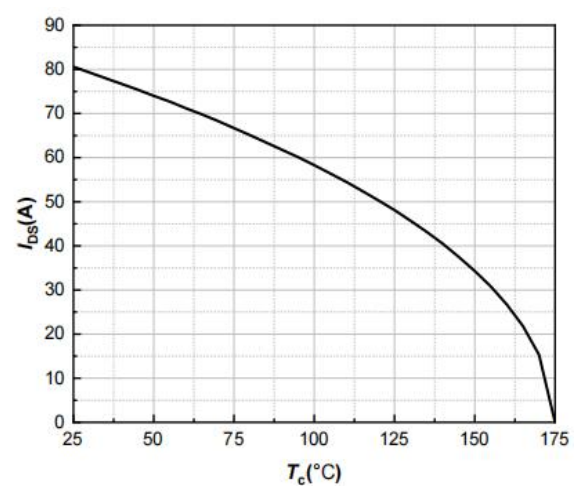




Fig.19 $P_{tot} t$ vs $T_c(^{\circ}C)$

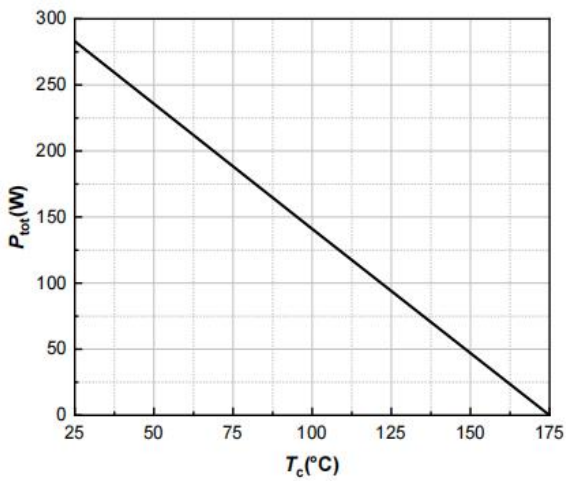


Fig.20 Transient Thermal Impedance

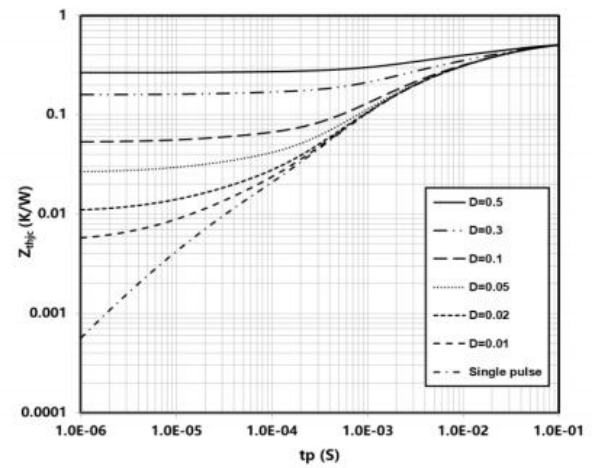


Fig.21 Clamped Inductive Switching Energy vs. Drain Current

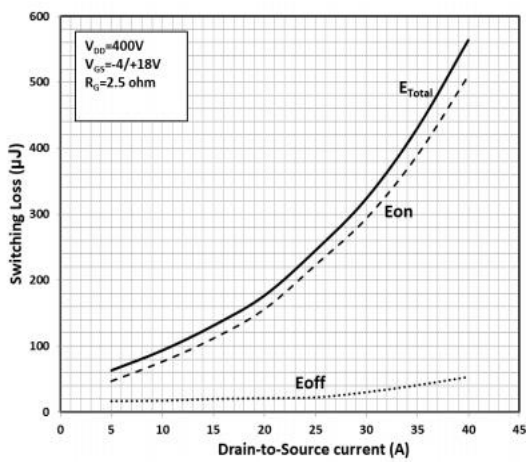


Fig.22 Clamped Inductive Switching Energy vs. R_G

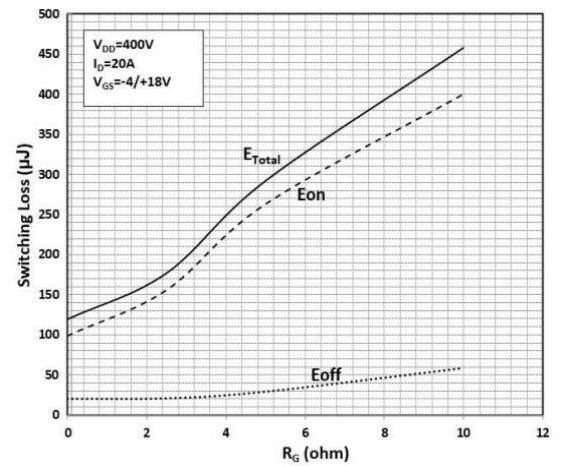


Fig.23 Switching Times vs. R_G

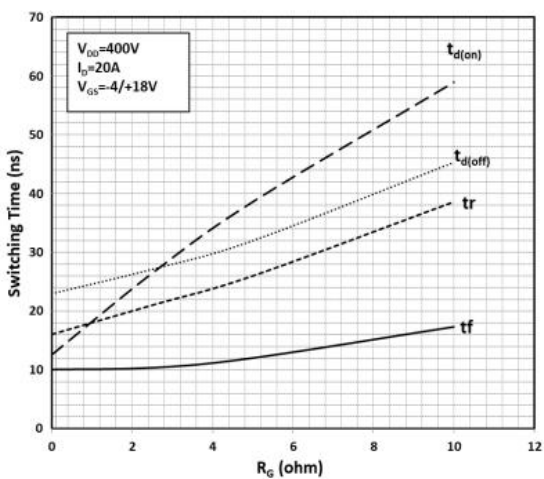
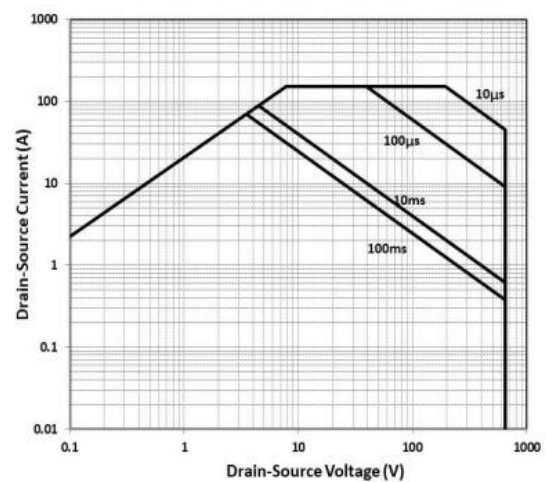


Fig.24 Safe Operating Area

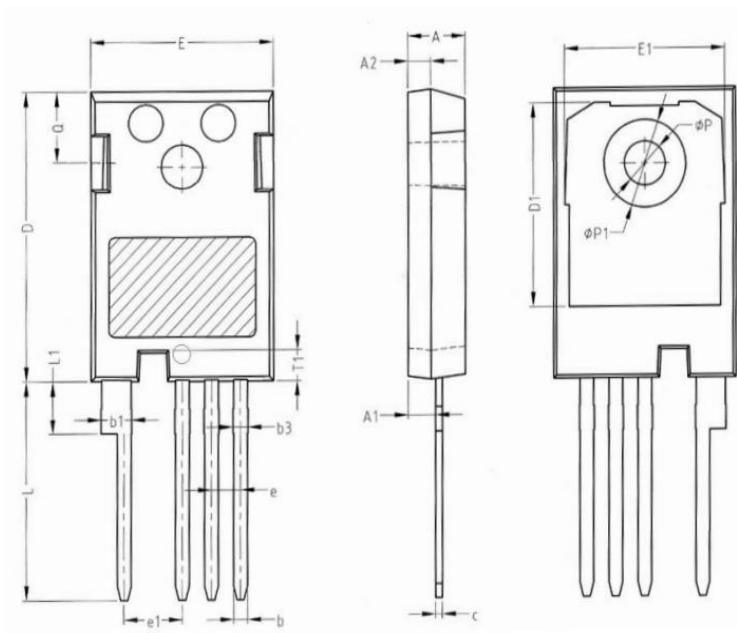




SC040N065J4

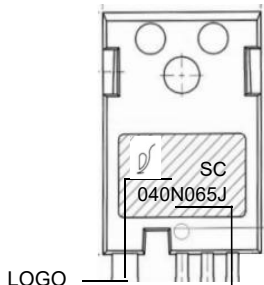
650V 77A N-CHANNEL POWER MOSFET

5.Dimensions



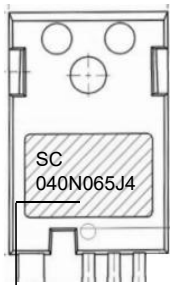
DIM	Unit(inch)		Unit(mm)	
	MIN	MAX	MIN	MAX
A	0.189	0.205	4.80	5.20
A1	0.087	0.103	2.21	2.61
A2	0.071	0.087	1.80	2.20
b	0.042	0.054	1.06	1.36
b1	0.092	0.115	2.33	2.93
b3	0.042	0.063	1.07	1.60
c	0.020	0.030	0.51	0.75
D	0.917	0.929	23.30	23.60
D1	0.640	0.663	16.25	16.85
E	0.620	0.635	15.74	16.14
E1	0.540	0.564	13.72	14.32
T1	0.093	0.104	2.35	2.65
e	2.54 BSC			
e1	5.08 BSC			
Q	0.216	0.240	5.49	6.09
L	0.680	0.704	17.27	17.87
L1	0.157	0.173	3.99	4.39
θp	0.134	0.150	3.40	3.80
θp1	7.19 REF			

6. Part Marking System



LOGO

Marking Code



Marking Code

7. Package Information

Package	Packing Type	Quantity(pcs)
TO-247	Tube	25



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