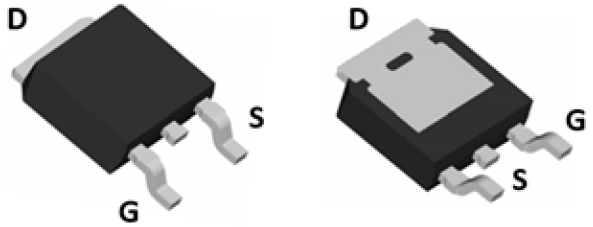
N-Channel Enhancement Mode Field Effect Transistor

Product Summary

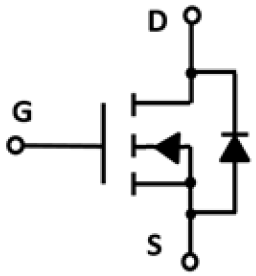
- V_{DS} 100V
- I_D 50A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜16 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜21 mohm
- 100% UIS Tested
- 100% ▽VDS Tested



Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

TO-252



■ Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_C=25℃	I_D	50	A
	T_C=100℃		28.5	
Pulsed Drain Current [A]		I_{DM}	180	A
Avalanche energy [B]		EAS	81	mJ
Total Power Dissipation [C]	Tc=25℃	P_D	72	W
	Tc=100℃		28.8	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [D]	t≤10S	$R_{\theta JA}$	15	20	℃/W
Thermal Resistance Junction-to-Ambient [D]	Steady-State		40	50	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	1.35	1.7	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
50N10A		/	2500	/	25000	13”Reel

■ Electrical Characteristics (T_j=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1	1.8	3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=20A		12	16	mΩ
		V_{GS}= 4.5V, I_D=20A		16	21	mΩ
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V			1.3	V
Maximum Body-Diode Continuous Current	I_S				45	A
Gate resistance	R_G	f= 1 MHz, Open drain		1		Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=50V,V_{GS}=0V,f=1MHZ		1135		pF
Output Capacitance	C_{oss}			399		
Reverse Transfer Capacitance	C_{rss}			18		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=50V,I_D=25A		16		nC
Gate-Source Charge	Q_{gs}			5.6		
Gate-Drain Charge	Q_{gd}			2.4		
Reverse Recovery Chrage	Q_{rr}	I_F=20A, di/dt=100A/us		42		
Reverse Recovery Time	t_{rr}			39.8		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=50V,I_D=25A R_{GEN}=2.2Ω		39.2		
Turn-on Rise Time	t_r			11		
Turn-off Delay Time	$t_{D(off)}$			53.2		
Turn-off fall Time	t_f			15.8		

■ Typical Performance Characteristics

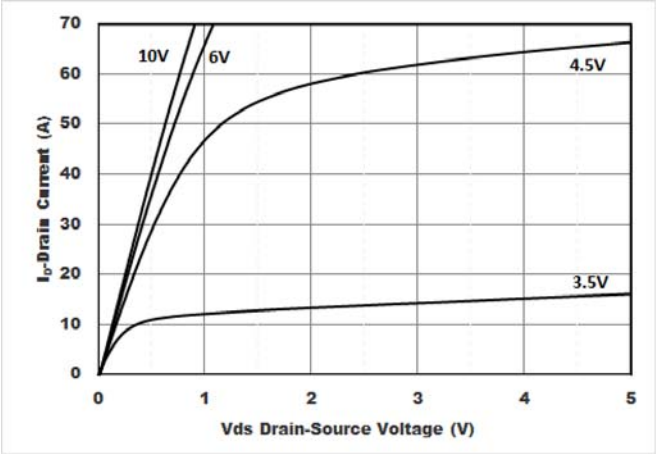


Figure1. Output Characteristics

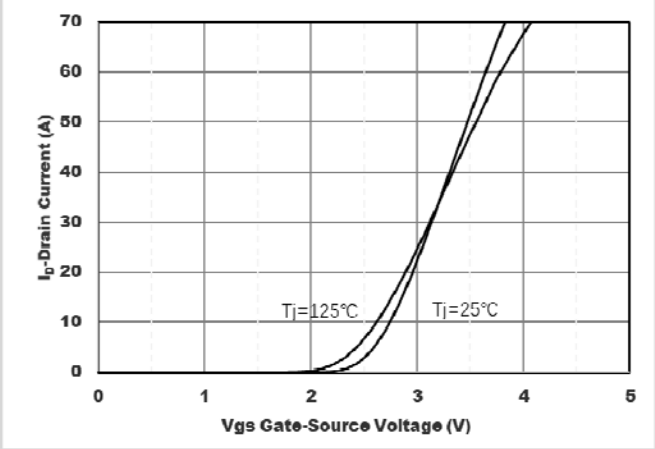


Figure2. Transfer Characteristics

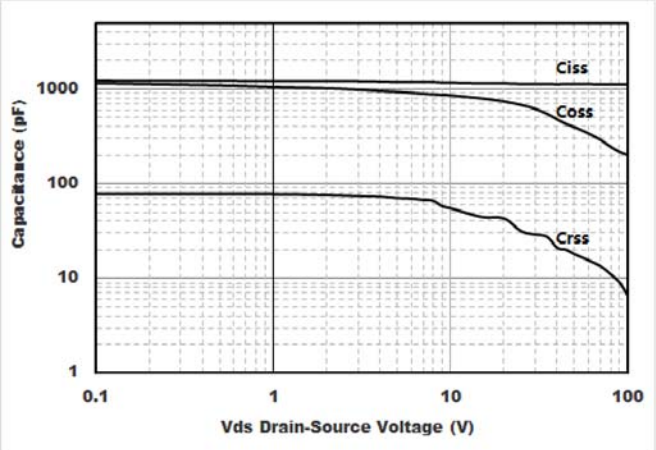


Figure3. Capacitance Characteristics

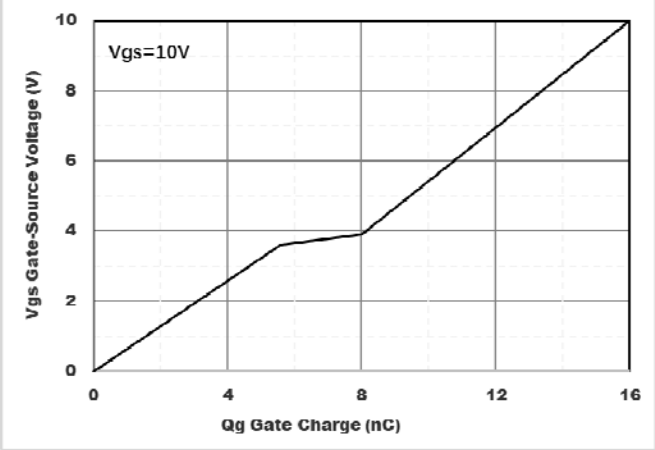


Figure4. Gate Charge

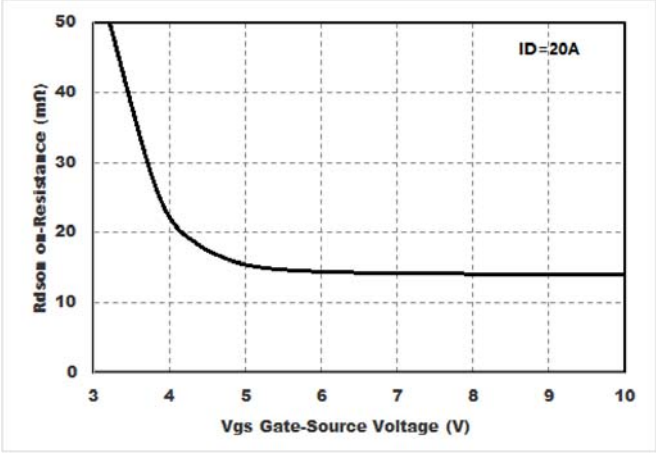


Figure5. **:** On-Resistance vs. Drain Current and Gate Voltage

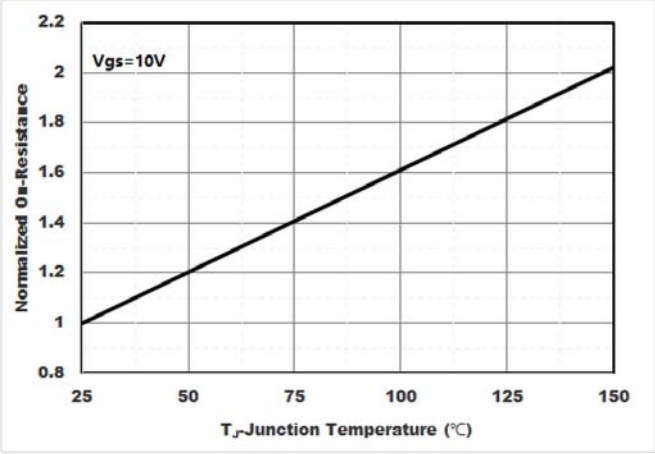


Figure6.Normalized On-Resistance

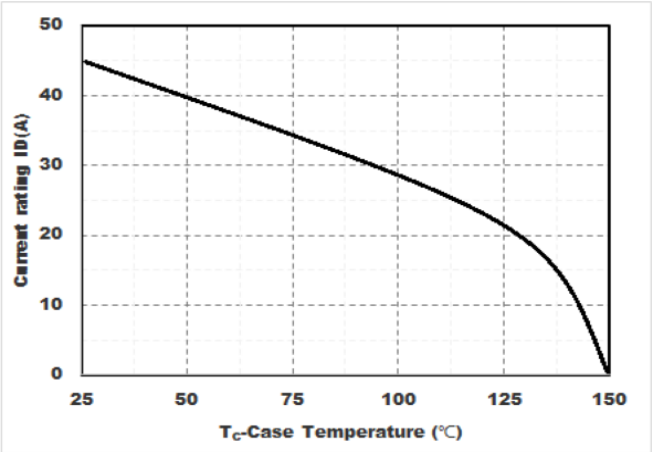


Figure7. Drain current

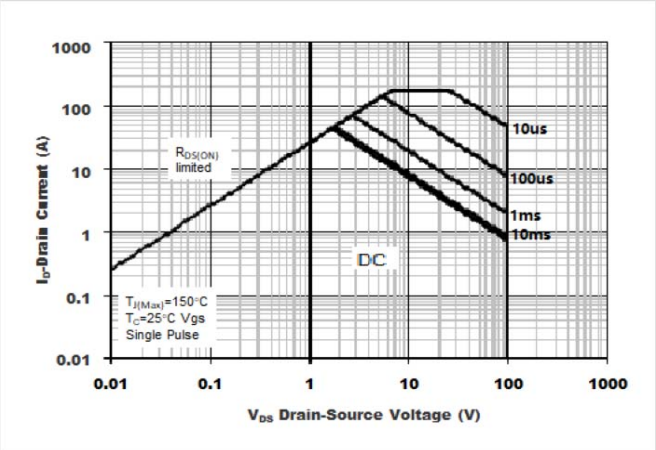


Figure8.Safe Operation Area

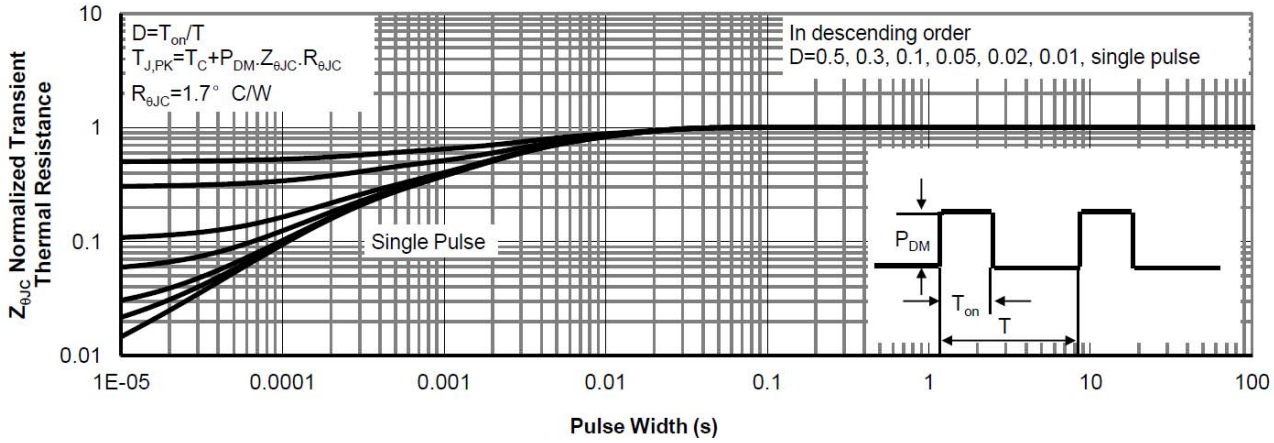
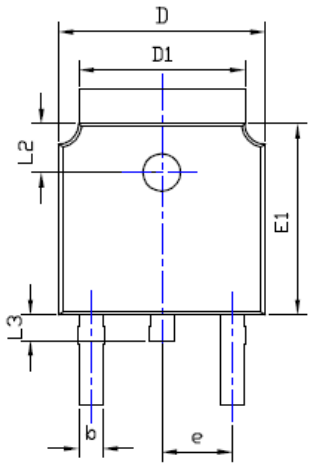
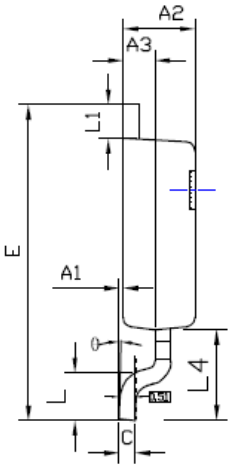


Figure9.Normalized Maximum Transient thermal impedance

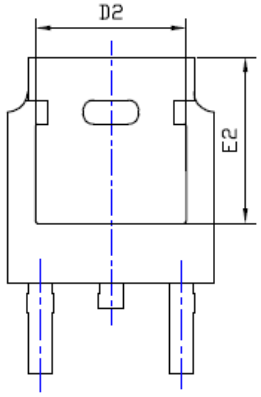
■ TO-252 Package information



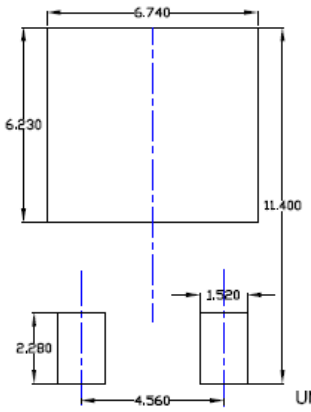
TOP VIEW



SIDE VIEW



BOTTOM VIEW



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS						
SYMBOL	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.008	0.000	---	0.200
A2	0.087	0.091	0.094	2.200	2.300	2.400
A3	0.035	0.039	0.043	0.900	1.000	1.100
b	0.026	0.030	0.034	0.660	0.760	0.860
c	0.018	0.020	0.023	0.460	0.520	0.580
D	0.256	0.260	0.264	6.500	6.600	6.700
D1	0.203	0.209	0.215	5.150	5.300	5.450
D2	0.181	0.189	0.195	4.600	4.800	4.950
E	0.390	0.398	0.406	9.900	10.100	10.300
E1	0.236	0.240	0.244	6.000	6.100	6.200
E2	0.203	0.209	0.215	5.150	5.300	5.450
e	0.090BSC			2.286BSC		
L	0.049	0.059	0.069	1.250	1.500	1.750
L1	0.035	---	0.050	0.900	---	1.270
L2	0.055	---	0.075	1.400	---	1.900
L3	0.240	0.310	0.039	0.600	0.800	1.000
L4	0.114REF			2.900REF		
θ	0°	---	10°	0°	---	10°