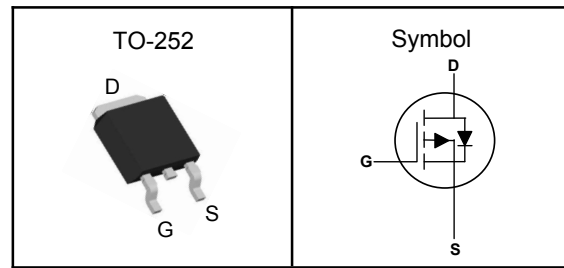


P-Channel Enhancement Mode MOSFET
Features

- Low $R_{ds(on)}$ for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description


V_{DSS}	-60	V
$R_{DS(ON)-Typ}$	12	m Ω
I_D	-56	A

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	-60	V
V_{GSS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	-55 to 175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	-224	A
I_D	Continuous Drain Current	-56	A
P_D	Maximum Power Dissipation	107	W
E_{AS}	Single Pulse Avalanche Energy	484	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case	1.15	$^\circ\text{C/W}$

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C .

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.



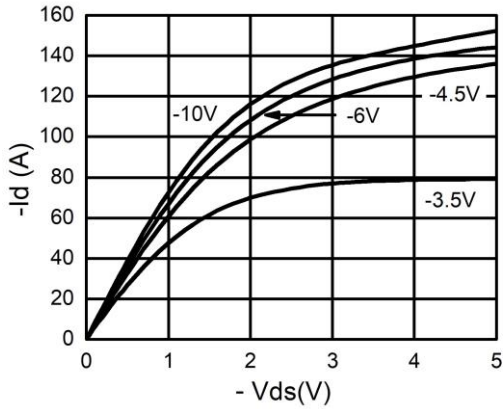
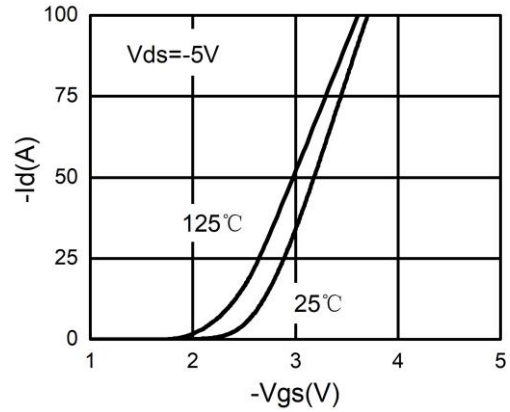
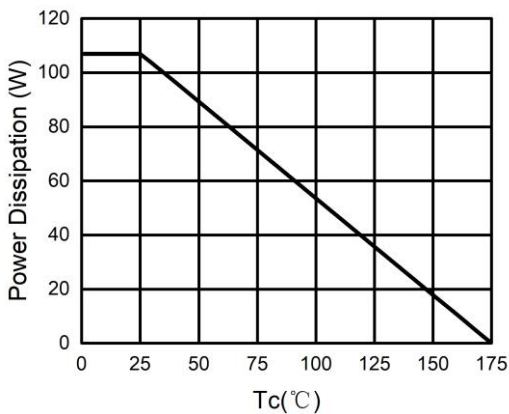
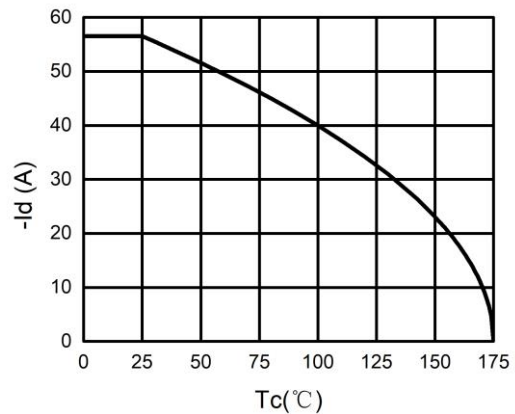
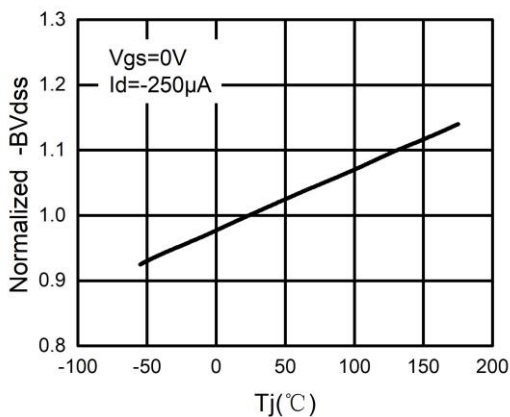
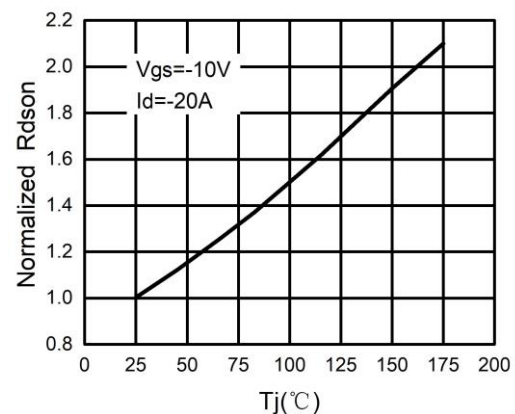
P-Channel Enhancement Mode MOSFET

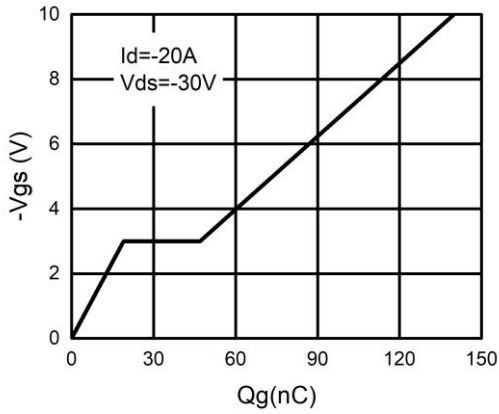
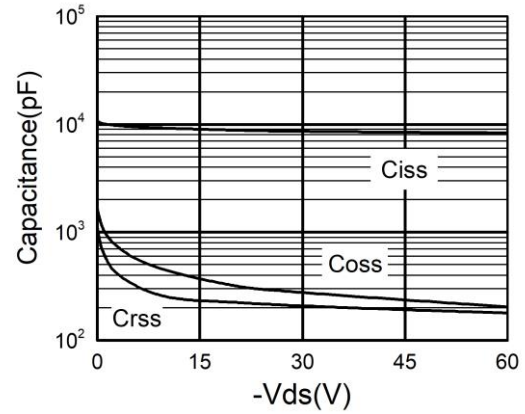
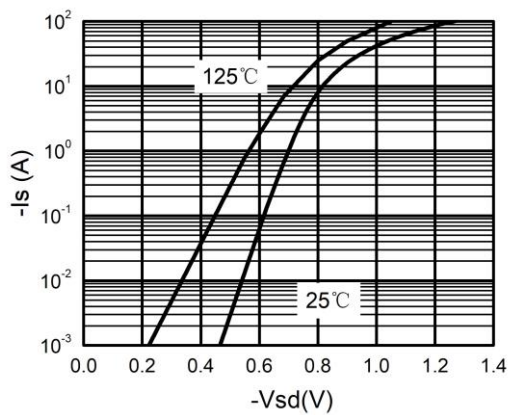
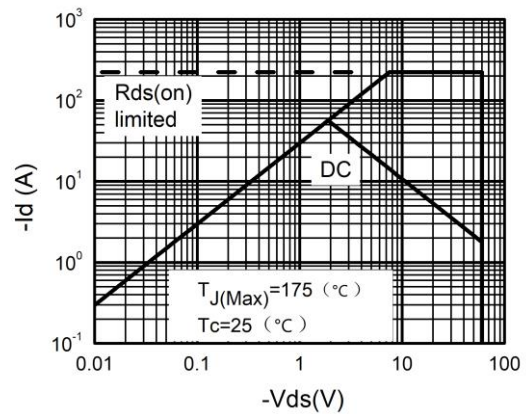
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

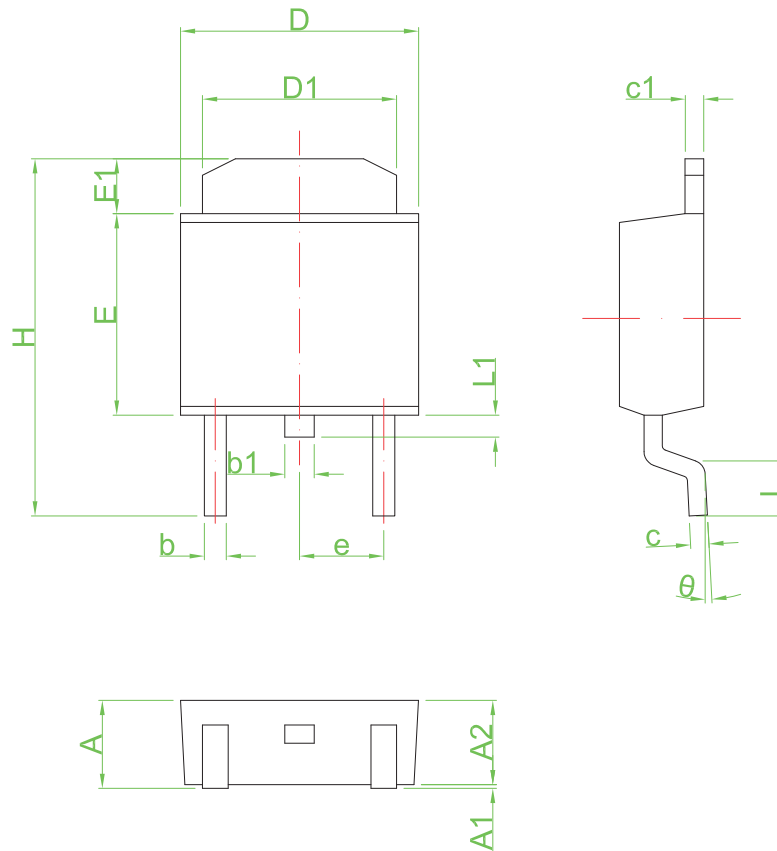
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-60V, V_{GS}=0V$	---	---	-1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	---	-2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_D=-15A$	---	12	15.5	$m\Omega$
		$V_{GS}=-4.5V, I_D=-10A$	---	14.5	19	$m\Omega$
gfs	Forward Transconductance	$V_{DS}=-5V, I_D=-20A$	---	38	---	S
Dynamic Characteristics^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-25V, \text{Freq.}=1\text{MHz}$	---	8700	---	pF
C_{oss}	Output Capacitance		---	290	---	
C_{rss}	Reverse Transfer Capacitance		---	210	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=-30V, V_{GS}=-10V, R_G=3\Omega, R_L=1.5\Omega$	---	26	---	nS
T_r	Turn-on Rise Time		---	21	---	
$T_{d(off)}$	Turn-off Delay Time		---	138	---	
T_f	Turn-off Fall Time		---	30	---	
Q_g	Total Gate Charge	$V_{DS}=-30V, V_{GS}=-10V, I_D=-20A$	---	140	---	nC
Q_{gs}	Gate-Source Charge		---	19	---	
Q_{gd}	Gate-Drain Charge		---	28	---	
Source-Drain Characteristics						
$V_{SD}^{④}$	Diode Forward Voltage	$V_{GS}=0V, I_S=-20A, T_J=25^{\circ}\text{C}$	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	$I_F=-20A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	56	---	nS
Q_{rr}	Reverse Recovery Charge		---	63	---	nC

Note ④: Pulse test (pulse width 300us, duty cycle 2%).

Note ⑤: Guaranteed by design, not subject to production testing.

P-Channel Enhancement Mode MOSFET
Typical Characteristics
Figure 1. Output Characteristics

Figure 2. Transfer Characteristics

Figure 3. Power Dissipation

Figure 4. Drain Current

Figure 5. BV_{DSS} vs Junction Temperature

Figure 6. $R_{DS(ON)}$ vs Junction Temperature


P-Channel Enhancement Mode MOSFET
Figure 7. Gate Charge Waveforms

Figure 8. Capacitance

Figure 9. Body-Diode Characteristics

Figure 10. Maximum Safe Operating Area


P-Channel Enhancement Mode MOSFET
TO-252 Package Outline Dimensions


Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.25	2.65	0.089	0.104
A1	0.00	0.15	0.000	0.006
A2	2.20	2.40	0.087	0.094
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.46	0.66	0.018	0.026
c1	0.46	0.66	0.018	0.026
D	6.30	6.70	0.248	0.264
D1	5.20	5.40	0.205	0.213
E	5.30	5.70	0.209	0.224
E1	1.40	1.60	0.055	0.063
H	9.40	9.90	0.370	0.390
e	2.30 TYP		0.09 TYP	
L	1.40	1.77	0.055	0.070
L1	0.50	0.70	0.020	0.028
theta	0°	8°	0°	8°