Features

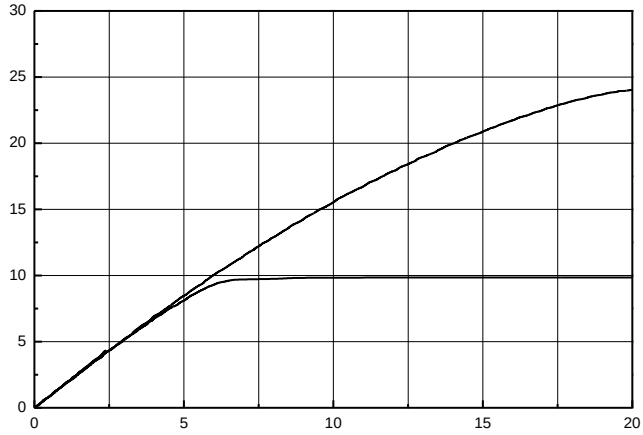
- Low gate charge
- 100% avalanche tested
- Improved dv/dt capability
- RoHS compliant
- JEDEC Qualification
- Improved ESD performance

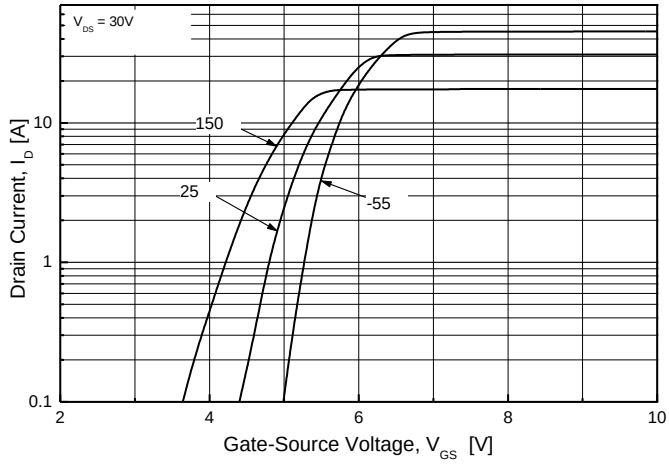
Absolute Maximum Ratings

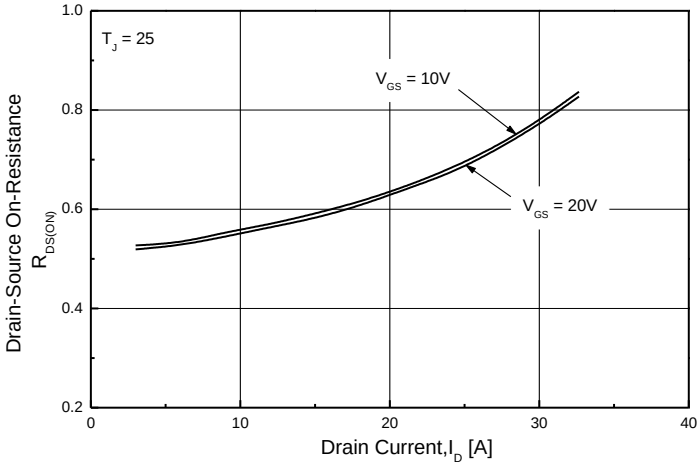
Electrical Characteristics : T_C=25 , unless otherwise noted

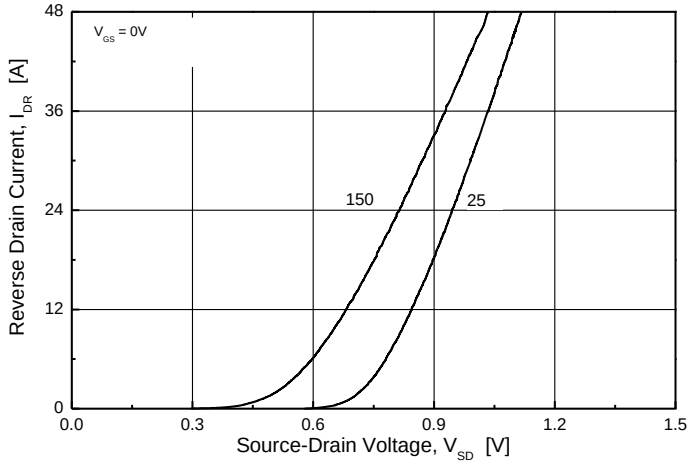
Parameter	Symbol	Test condition	Min	Typ	Max	Units
OFF						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250 µA	800	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 800 V, V_{GS} = 0 V	--	--	1	µA
		V_{DS} = 640 V, T_C = 125°C	--	--	10	µA
Forward Gate-Source Leakage Current	I_{GSSF}	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	µA
Reverse Gate-Source Leakage Current	I_{GSSR}	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	µA
ON						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	3	--	5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 6.0 A	--	0.53	0.65	Ω
Forward Transconductance (Note 4)	g_{FS}	V_{DS} = 30 V, I_D = 6.0 A	--	18	--	S
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	3370	--	pF
Output Capacitance	C_{oss}		--	310	--	pF
Reverse Transfer Capacitance	C_{rss}		--	33	--	pF
SWITCHING						
Turn-On Delay Time (Note 4,5)	$t_{d(on)}$	V_{DD} = 400 V, I_D = 12 A, R_G = 25	--	81	--	ns
Turn-On Rise Time (Note 4,5)	t_r		--	90	--	ns
Turn-Off Delay Time (Note 4,5)	$t_{d(off)}$		--	266	--	ns
Turn-Off Fall Time (Note 4,5)	t_f		--	63	--	ns
Total Gate Charge (Note 4,5)	Q_g	V_{DS} = 640 V, I_D = 12 A, V_{GS} = 10 V	--	79	--	nC
Gate-Source Charge (Note 4,5)	Q_{gs}		--	16	--	nC
Gate-Drain Charge (Note 4,5)	Q_{gd}		--	37	--	nC
SOURCE DRAIN DIODE						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	--	--	12	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	--	--	48	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 12 A	--	--	1.5	V
Reverse Recovery Time (Note 4)	t_{rr}	V_{GS} = 0 V, I_S = 12 A	--	528	--	ns
Reverse Recovery Charge (Note 4)	Q_{rr}	dI_F / dt = 100 A/µs	--	6.7	--	µC

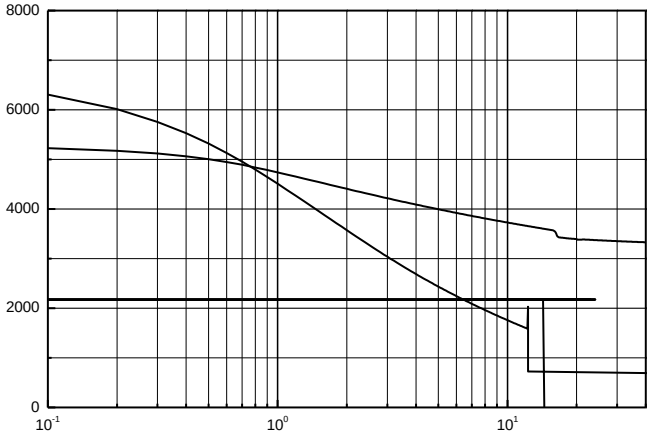
Note :
1. Repeated rating : Pulse width limited by safe operating area
2. L=4.08mH, I_{AS} = 12A, V_{DD} = 50V, R_G = 25 , Starting T_J= 25
3 I_{SD} 12A, di/dt µs , V_{DD} $_{DS}$, Starting T_J= 25
µ
5. Essentially Independent of Operating Temperature Typical Characteristics

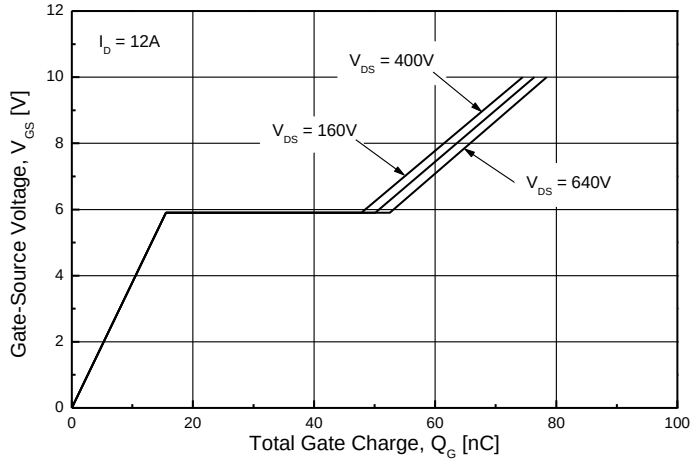

30
25
20
15
10
5
0
0
5
10
15
20

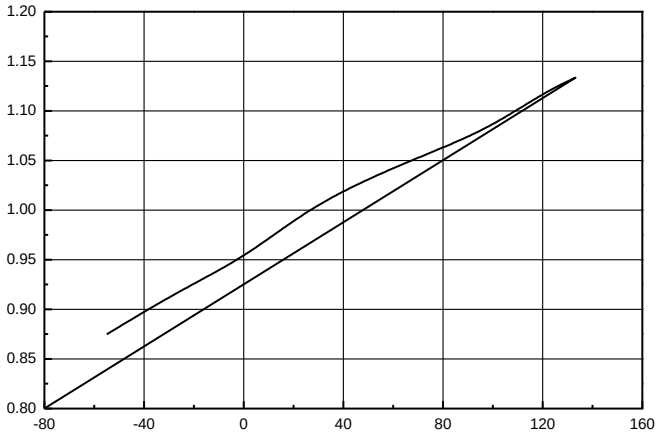

V_DS = 30V
150
25
-55
Drain Current, I_D [A]
10
1
0.1
2
4
6
8
10
Gate-Source Voltage, V_GS [V]

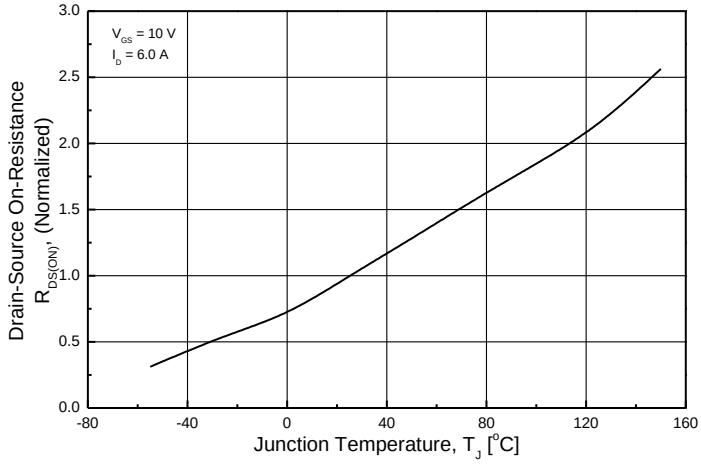

T_J = 25
V_GS = 10V
V_GS = 20V
Drain-Source On-Resistance
R_DS(ON)
1.0
0.8
0.6
0.4
0.2
0
10
20
30
40
Drain Current,I_D [A]

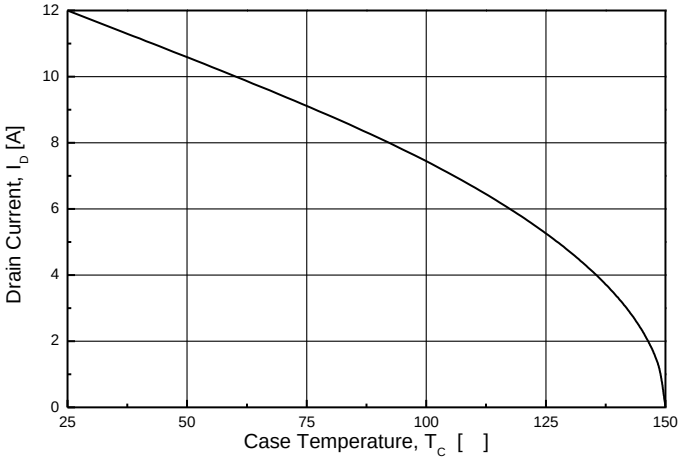

V_GS = 0V
150
25
Reverse Drain Current, I_DR [A]
48
36
24
12
0
0.0
0.3
0.6
0.9
1.2
1.5
Source-Drain Voltage, V_SD [V]

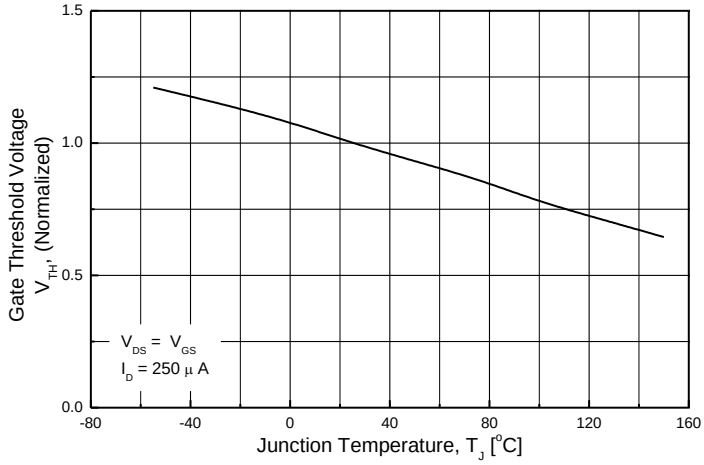

8000
6000
4000
2000
0
10^-1
10^0
10^1

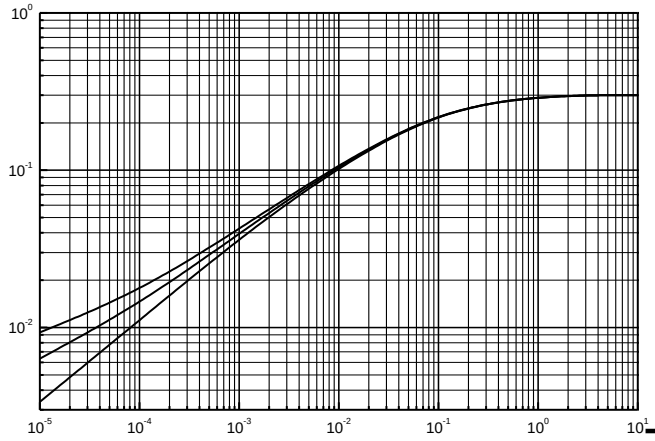

I_D = 12A
V_DS = 400V
V_DS = 160V
V_DS = 640V
Gate-Source Voltage, V_GS [V]
12
10
8
6
4
2
0
0
20
40
60
80
100
Total Gate Charge, Q_G [nC]

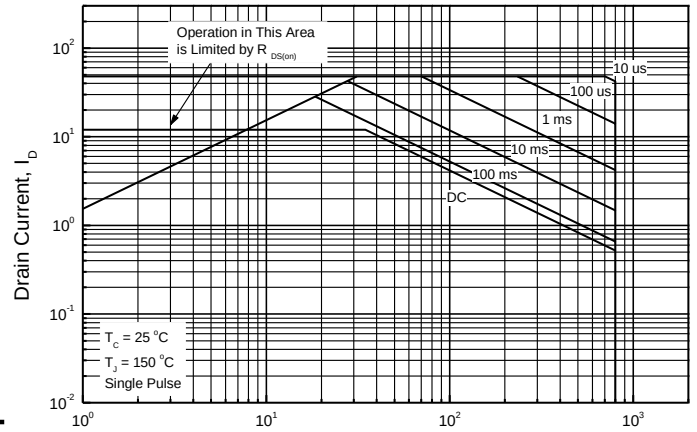

1.20
1.15
1.10
1.05
1.00
0.95
0.90
0.85
0.80
-80
-40
0
40
80
120
160


V_{GS} = 10 V
I_D = 6.0 A
Drain-Source On-Resistance
$R_{DS(ON)}$, (Normalized)
Junction Temperature, T_J [°C]


Drain Current, I_D [A]
Case Temperature, T_C [ ]

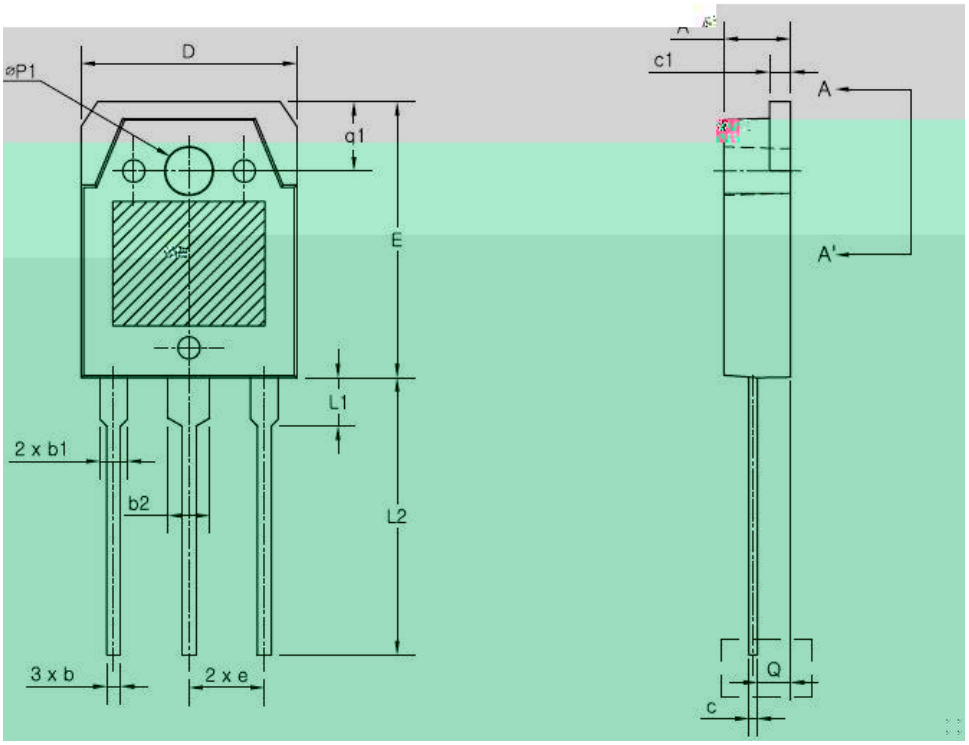

Gate Threshold Voltage
V_{TH}, (Normalized)
V_{DS} = V_{GS}
I_D = 250 μ A
Junction Temperature, T_J [°C]

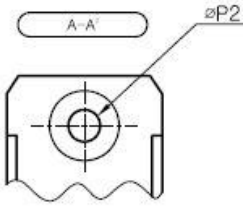



Operation in This Area
is Limited by $R_{DS(on)}$
10 us
100 us
1 ms
10 ms
100 ms
DC
Drain Current, I_D
T_c = 25 °C
T_J = 150 °C
Single Pulse

T

TO-3PN MECHANICAL DATA





SYMBOL	MIN	NOM	MAX
A	4.60	4.80	5.00
øP1	3.30	3.40	3.50