

60A 160V N-Channel Power MOSFET

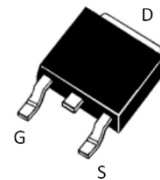
DESCRIPTION :

- Extremely low on-resistance $R_{DS(on)}$
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔV_{DS} test
- RoHS standard/Pb-Free plating/Halogen-Free
- AEC-Q101 qualified

V_{DS}	160V
I_D	60A
$R_{DS(ON_Typ.)}$	16m Ω

TYPICAL APPLICATIONS :

- Motor Control and Drive
- Charge/Discharge for Battery Management System
- Synchronous Rectifier for SMPS



TO-252

MAXIMUM RATINGS (at $T_C = 25^\circ\text{C}$, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	160	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$	I_D	60 42	A
Pulsed Drain Current	($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D\ pulse}$	240	A
Single Pulsed Avalanche Energy ⁽¹⁾	$L=0.5\text{mH}$, $R_g=25\Omega$	EAS	156	mJ
Power dissipation	$T_C=25^\circ\text{C}$ $T_A=25^\circ\text{C}$	P_{tot}	136 2.0	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	$^\circ\text{C}$

Notes : 1. EAS was tested at $T_J = 25^\circ\text{C}$, $L = 0.5\text{mH}$, $I_D=18\text{A}$..

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	75 1.1	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage $V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	160			V
Gate-Source threshold voltage $V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(th)}$	2.5		4.0	V
Zero Gate Voltage Drain Current $V_{DS} = 150V, V_{GS} = 0V, T_J = 25\text{ }^\circ\text{C}$ $V_{DS} = 150V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$	I_{DSS}			1 100	μA
Gate-Source Leakage Current $V_{GS} = 20V, V_{DS} = 0V$	I_{GSS}			100	nA
Drain-Source On-State Resistance $V_{GS} = 10V, I_D = 30A, T_J = 25\text{ }^\circ\text{C}$	$R_{DS(on)}$		16	19	m Ω
Forward Transfer Conductance $V_{DS}=5V, I_D=30A$	g_{fs}		34		S
Input capacitance $f=1MHz, V_{DS}= 75V, V_{GS}=0V$	C_{iss}		1353		pF
Output capacitance $f=1MHz, V_{DS}= 75V, V_{GS}=0V$	C_{oss}		213		pF
Reverse transfer capacitance $f=1MHz, V_{DS}= 75V, V_{GS}=0V$	C_{rss}		11		pF
Total Gate Charge $V_{DS}= 75V, I_D= 30A, V_{GS}= 10V$	Q_G		21		nC
Gate to Source Charge $V_{DS}= 75V, I_D= 30A, V_{GS}= 10V$	Q_{GS}		8.5		nC
Gate to Drain Charge $V_{DS}= 75V, I_D= 30A, V_{GS}= 10V$	Q_{GD}		4.8		nC
Gate plateau voltage $V_{DS}= 75V, I_D= 30A, V_{GS}= 10V$	$V_{plateau}$		5.7		V
Turn-on delay time $V_{DD}= 75V, V_{GS}= 10V, I_D= 30A, R_G =3\Omega$	$t_{d(ON)}$		9.0		ns
Rise time $V_{DD}= 75V, V_{GS}= 10V, I_D= 30A, R_G =3\Omega$	t_r		23		ns
Turn-off delay time $V_{DD}= 75V, V_{GS}= 10V, I_D= 30A, R_G =3\Omega$	$t_{d(OFF)}$		18		ns
Fall time $V_{DD}= 75V, V_{GS}= 10V, I_D= 30A, R_G =3\Omega$	t_f		7		ns

Body Diode

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Max Current	I_S			60	A
Diode Forward Voltage $V_{GS} = 0V, I_S = 30A$	V_{SD}			1.2	V
Revers Recovery Time $I_F = 30A, di/dt = 100A/us, V_{GS} = 0V$	T_{rr}		71		ns
Revers Recovery Charge $I_F = 30A, di/dt = 100A/us, V_{GS} = 0V$	Q_{rr}		109		nC

Typical Performance Characteristics

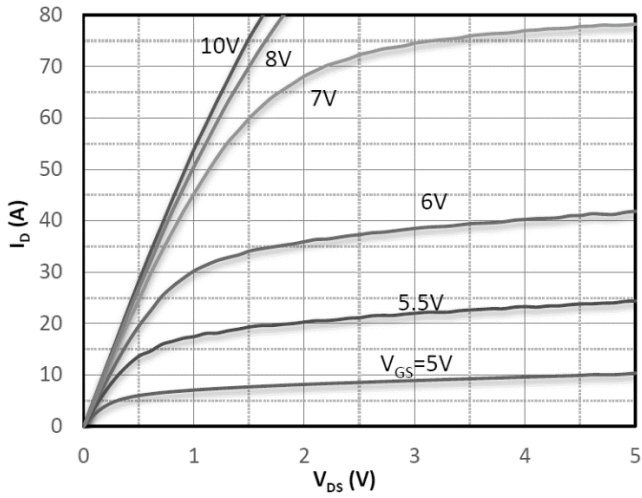


Figure 1 Output Characteristics

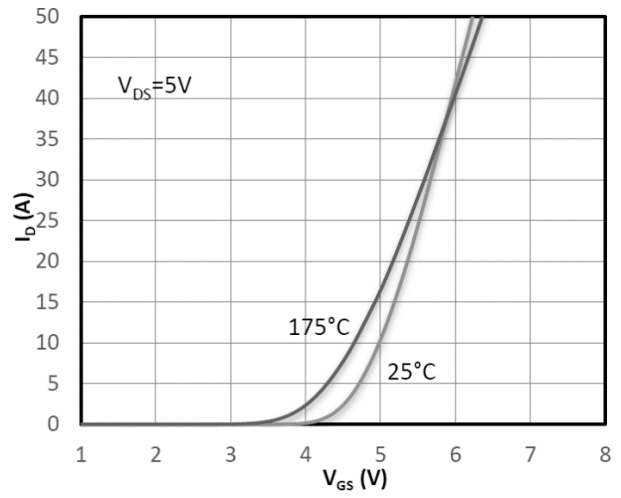


Figure 2. Transfer Characteristics

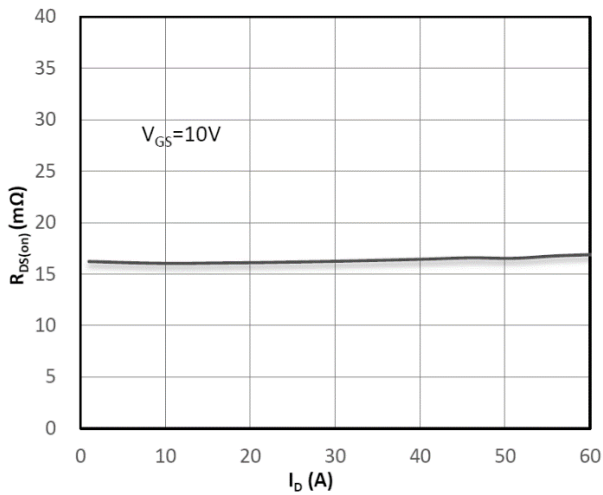


Figure 3. $R_{ds(on)}$ vs Drain Current

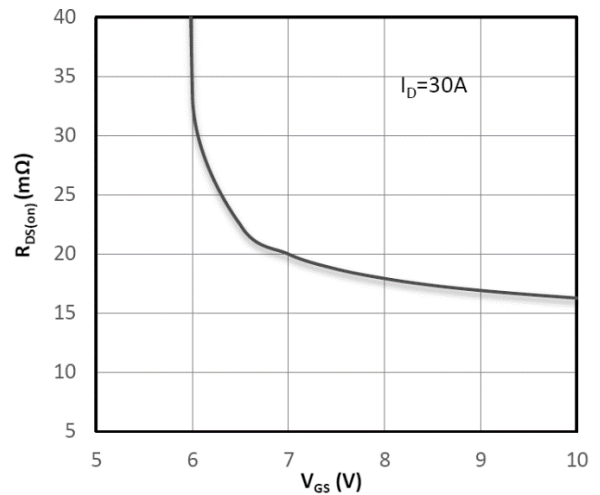


Figure 4. $R_{ds(on)}$ vs Gate Voltage

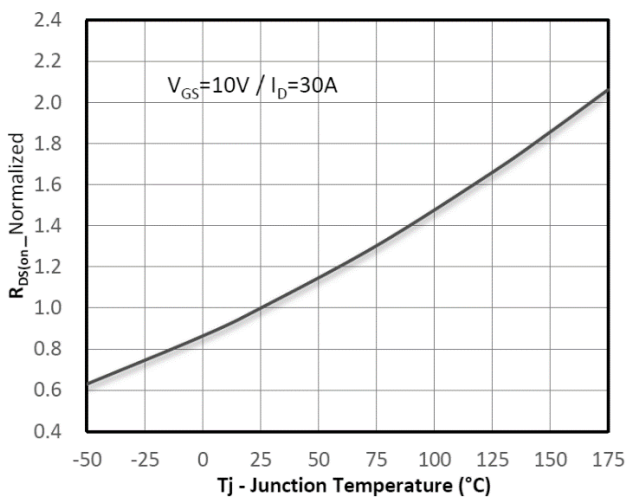


Figure 5. $R_{ds(on)}$ vs. Temperature

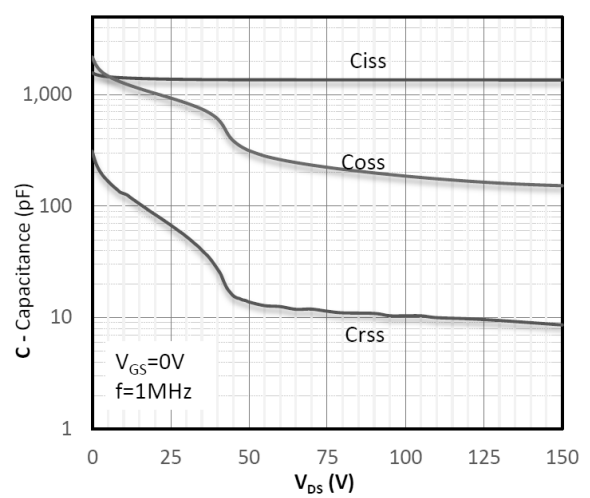


Figure 6. Capacitance Characteristics

Typical Performance Characteristics

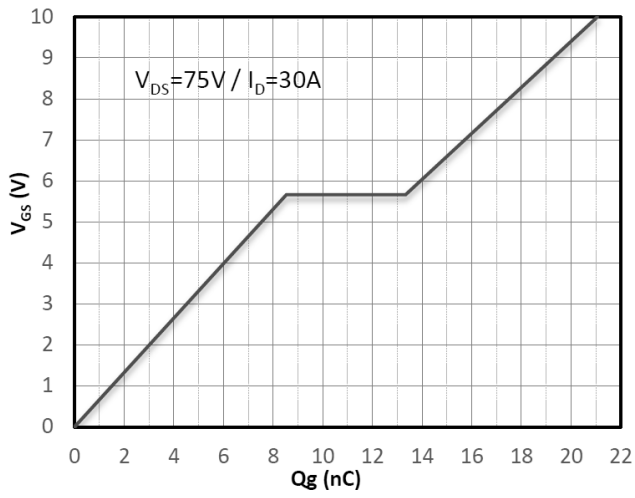


Figure 7. Gate Charge Characteristics

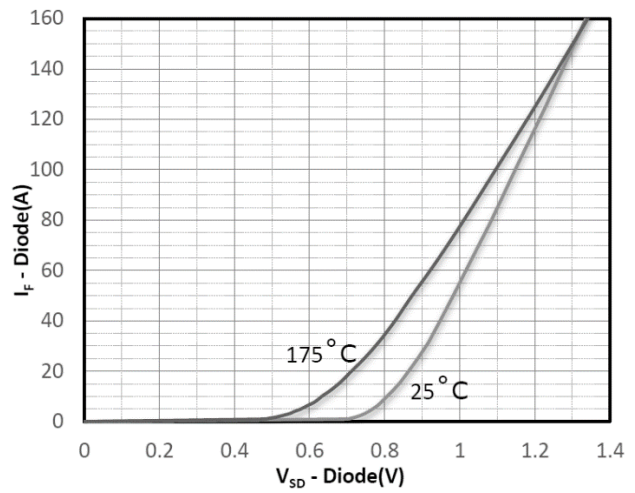


Figure 8. Body-diode Forward Characteristics

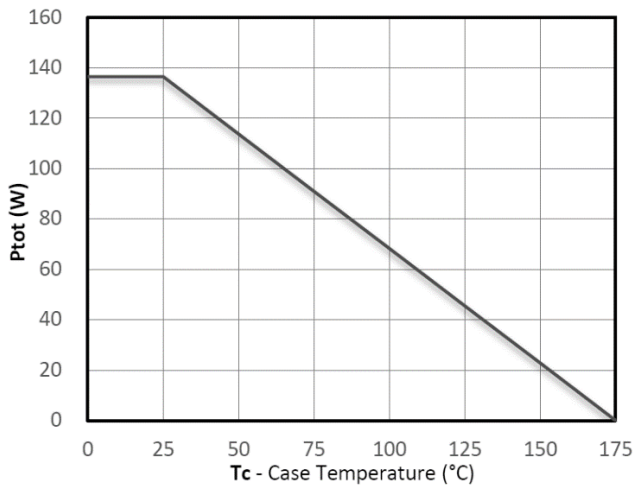


Figure 9. Power De-rating

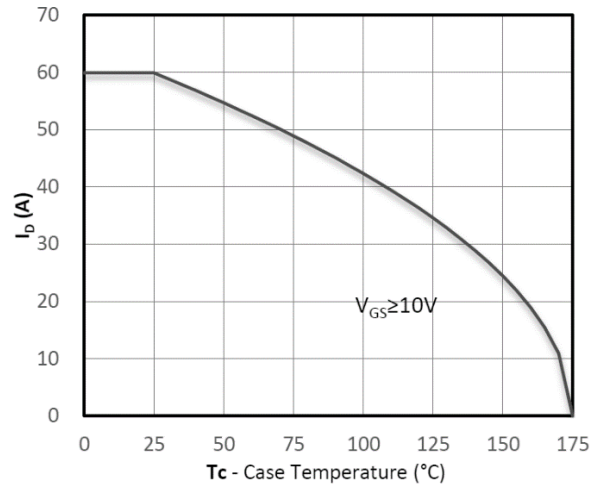


Figure 10. Current De-rating

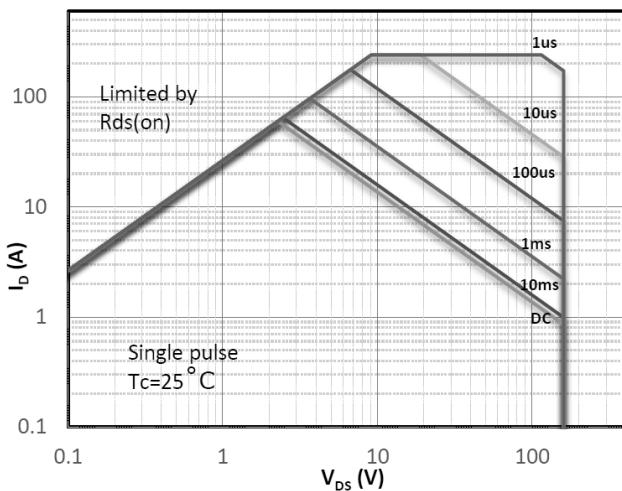


Figure 11. Safe Operating Area

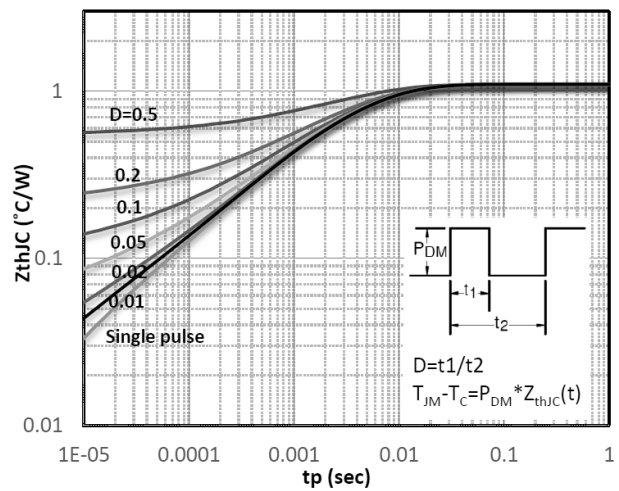
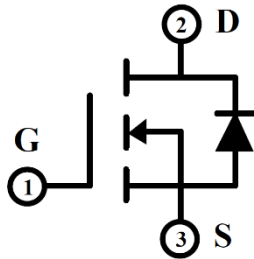
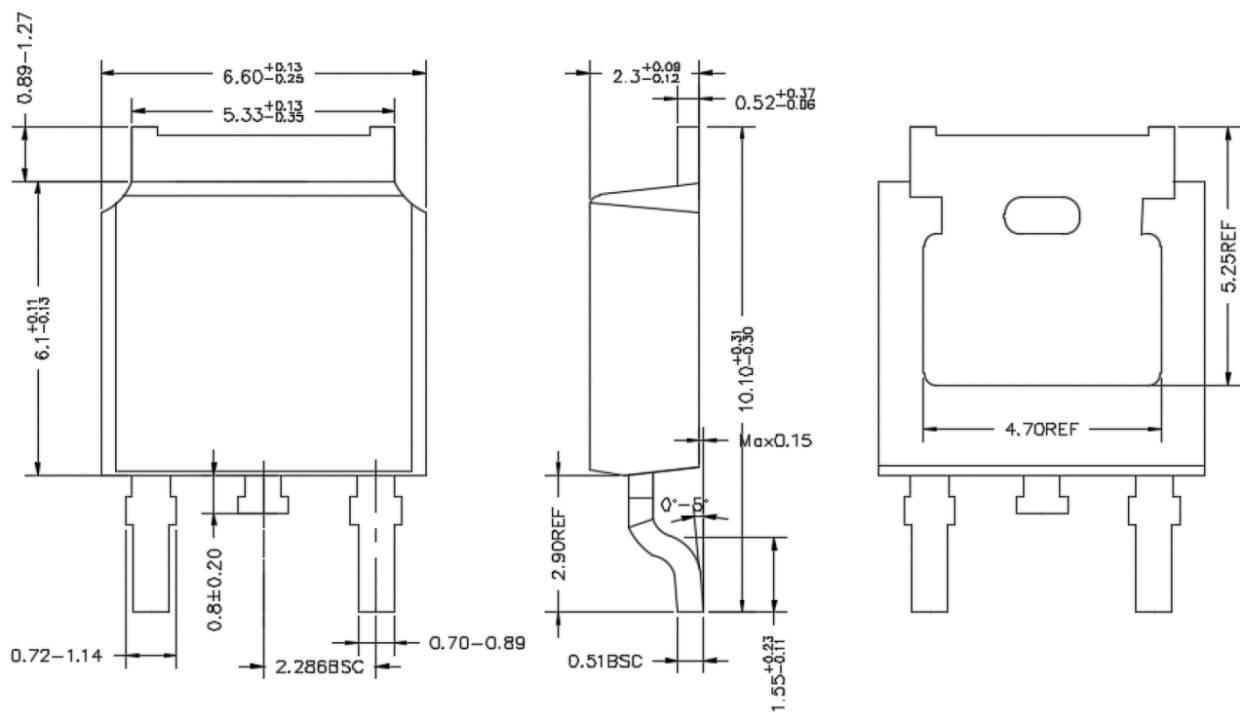


Figure 12. Max. Transient Thermal Impedance

·Circuit diagram



·Package outlines : Dimensions in (mm)



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