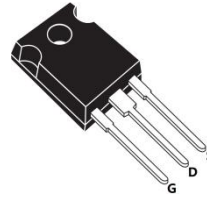


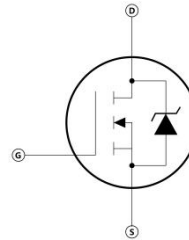
Features

- N channel super junction structure
- 100% avalanche tested
- Avalanche ruggedness
- Gate charge minimized
- Very low intrinsic capacitance
- Very low on-resistance



Applications

- UPS
- PV Inverter
- Switching applications



Electrical ratings

Absolute maximum ratings			
Parameter	Symbol	Value	Unit
Drain-source voltage ($V_{GS} = 0$)	V_{DSS}	650	V
Transient Gate- source voltage	V_{GSM}	± 30	
Continuous Gate- source voltage	V_{GSS}	± 20	
Drain current (continuous) at $T_C = 25\text{ }^{\circ}\text{C}$	I_D	50	A
Drain current (continuous) at $T_C = 100\text{ }^{\circ}\text{C}$		28	
Drain current (pulsed)	I_{DM}	120	
Total dissipation at $T_C = 25\text{ }^{\circ}\text{C}$	P_{TOT}	290	W
Derating factor		2.32	W/ $^{\circ}\text{C}$
Operating junction temperature	T_J	-55 to 150	$^{\circ}\text{C}$
Storage temperature	T_{stg}		
Maximum lead temperature for soldering purpose	T_J	260	$^{\circ}\text{C}$

Thermal data			
Parameter	Symbol	Value	Unit
Thermal resistance junction-case max	$R_{thj-case}$	0.43	$^{\circ}\text{C}/\text{W}$
Thermal resistance junction-ambient max	$R_{thj-amb}$	63	

Avalanche characteristics			
Parameter	Symbol	Max value	Unit
Repetitive avalanche current	I_{AR}	50	A

Single pulse avalanche energy (starting $T_J = 25\text{ }^{\circ}\text{C}$, $I_D = I_{AR}$, $V_{DD} = 50\text{ V}$)	E_{AS}	1000	mJ
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Electrical Characteristics ($T_{vj} = 25^{\circ}\text{C}$ unless otherwise specified)

On /off states						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1\text{ mA}$, $V_{GS} = 0$	650			V
Zero gate voltage drain current ($V_{GS} = 0$)	I_{DSS}	$V_{DS} = \text{Max rating}$ $V_{DS} = \text{Max rating}$, $T_C = 125\text{ }^{\circ}\text{C}$		10		μA
Gate-body leakage current ($V_{DS} = 0$)	I_{GSS}	$V_{GS} = \pm 30\text{ V}$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	3	4	5	V
Static drain-source on resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$ @25 $^{\circ}\text{C}$ @150 $^{\circ}\text{C}$		0.085 0.20	0.099	Ω

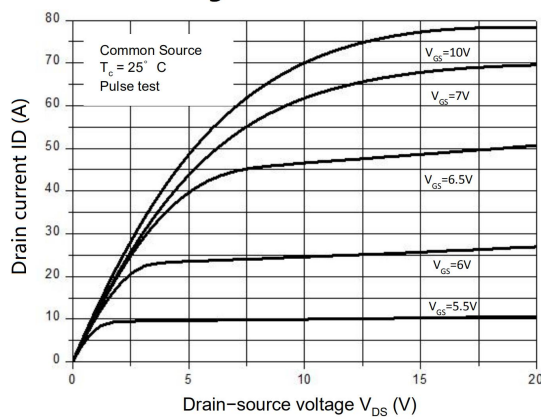
Dynamic						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Input capacitance	C_{iss}	$V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$, $V_{GS} = 0$		3010		pF
Output capacitance	C_{oss}			1200		
Reverse transfer capacitance	C_{rss}			10		
Gate input resistance	R_g	$f = 1\text{ MHz}$ Gate DC Bias=0 Test signal level=20mV open drain		2.0		Ω
Total gate charge	Q_g	$V_{DD} = 400\text{ V}$, $I_D = 20\text{ A}$ $V_{GS} = 10\text{ V}$		17.8		nC
Gate-source charge	Q_{gs}			23		
Gate-drain charge	Q_{gd}			63		
Gate plateau voltage	V_P			6		V

Switching times						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 400\text{ V}$, $I_D = 20\text{ A}$, $R_G = 10\text{ }\Omega$, $V_{GS} = 10\text{ V}$		31		ns
Rise time	t_r			43		
Turn-off-delay time	$t_{d(off)}$			150		
Fall time	t_f			13		

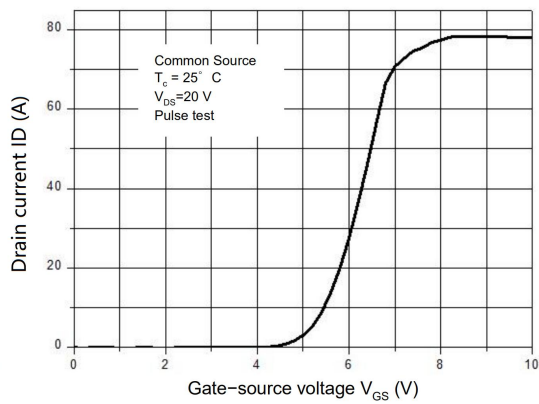
Source drain diode						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Forward on voltage	V_{SD}	$I_{SD} = 20\text{ A}$, $V_{GS} = 0\text{ V}$		1.2		V
Reverse recovery time	t_{rr}	$I_{SD} = 20\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 60\text{ V}$		198		ns
Reverse recovery charge	Q_{rr}			3.2		μC
Reverse recovery current	I_{RRM}			15		A

Electrical characteristics

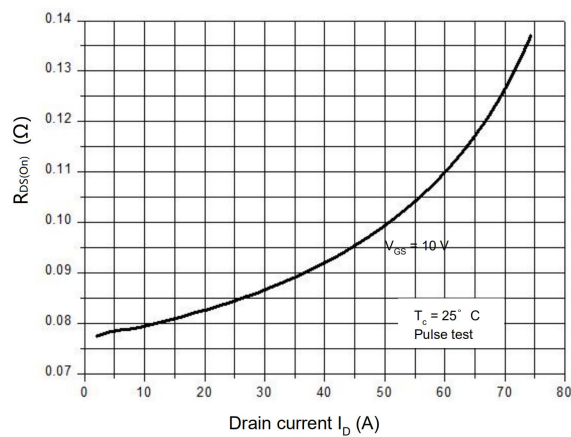
On-Region Characteristics



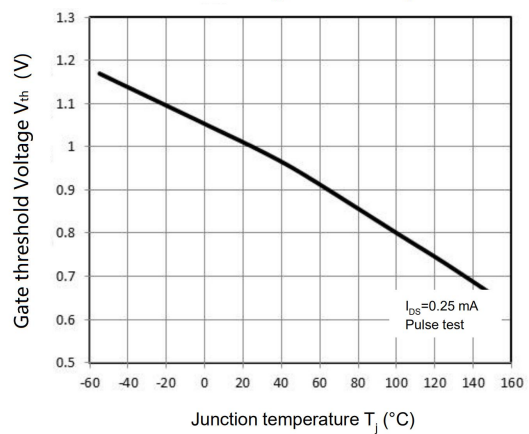
Transfer Characteristics



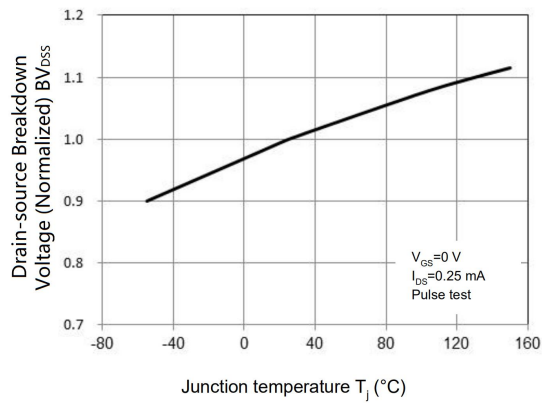
On-Resistance Variation vs. Drain current



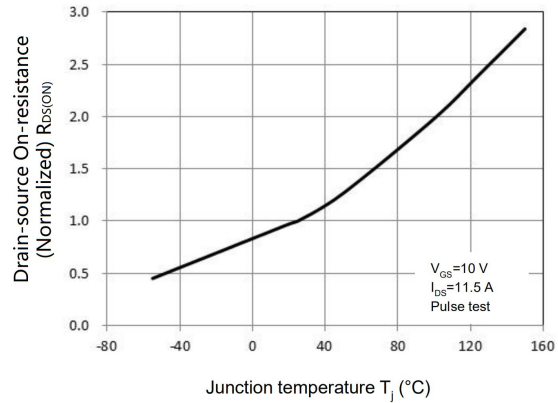
Threshold Voltage vs. Temperature



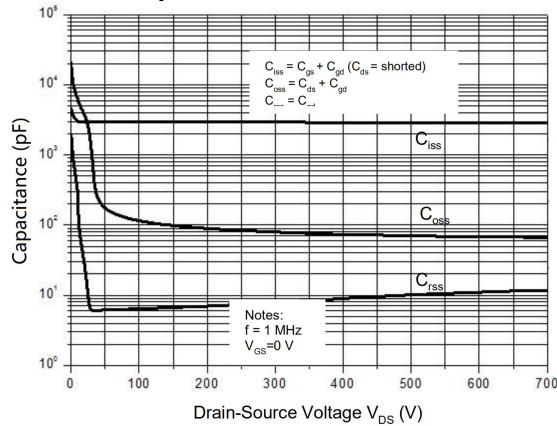
Breakdown Voltage vs. Temperature



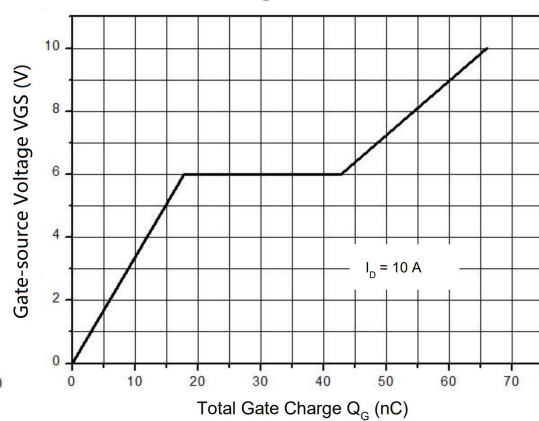
On-Resistance vs. Temperature



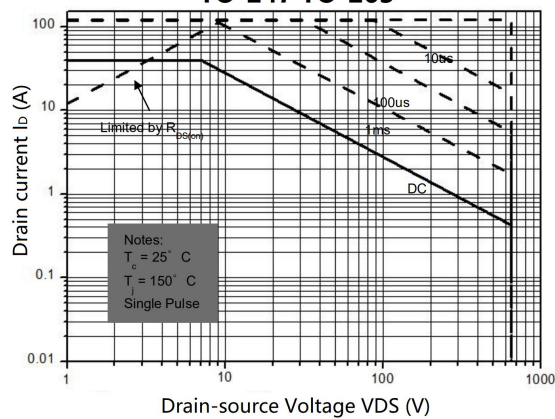
Capacitance Characteristucs



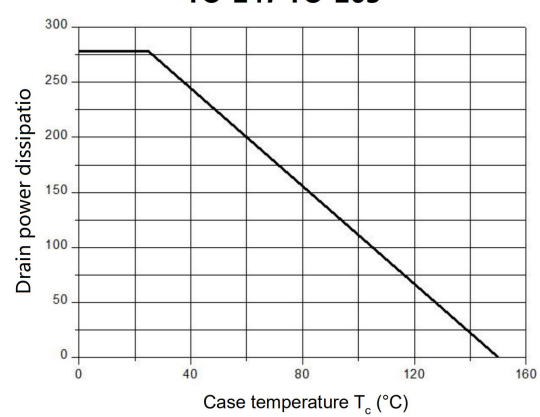
Gate Charge Characterist



Maxinun Safe Operating Area
TO-247 TO-263



Power Dissipation vs. Temperature
TO-247 TO-263



Package outline dimension

